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RADIOTHERAPY FOR INFLAMMATORY CONDITIONS *

ARTHUR U. DESJARDINS, M.D.

ROCHESTER, MINN.

The value of radiotherapy in the treatment of many acute, subacute and chronic inflammatory processes is not as well known as it deserves to be. This is apparently because the sound experimental basis and the mass of clinical and other evidence on which it rests have not been considered, and because many questionable or wholly unfounded ideas have been advanced as explanations. As in so many other phases of radiotherapy, the first knowledge of the possible value of irradiation in inflammatory conditions resulted from the observation of unexpected benefit following exposure, for diagnostic purposes, of parts of the body which were the seat of inflammatory lesions.

FURUNCLE, CARBUNCLE AND OTHER PYOGENIC INFECTIONS

The influence of irradiation on such lesions, especially when treated during the stage of maximal leukocytic infiltration, which is to say before the stage of frank suppuration, has been demonstrated by Coyle [1] (1906), Dunham [2] (1916), Ross [3] (1917), Richards [4] (1922), Lewis [5] (1923), Hodges [6] (1924, 1925), Heidenhain and Fried [7] (1924), Pordes [8] (1923, 1924, 1926), Holzknecht [9] (1926), Gerber [10] (1926), Fraenkel and Nissnjewitsch [11] (1926), Solomon and Blondeau [12] (1927), Carp [13] (1927), Pordes [14] (1929) and many others. Even now, however, this method of treatment is not used as widely as it might be, probably because its value is not generally realized. A review of all the published reports shows that the majority of patients derive great and prompt benefit. Pain is relieved in about twenty-four hours, although in a small percentage such relief may be preceded by a temporary increase in the pain. The best results are obtained when the lesions are treated early. The behavior and subsequent course of the inflammatory process is greatly altered. Many such lesions never reach the suppurative stage. The advantages of the treatment are that it is most effective during the early stages when other methods of treatment are least effective; it is painless and inexpensive and does not interfere with the patient's activities; it often relieves pain in a few hours, makes hot or other dressings unnecessary or shortens the period during which they must be applied, often makes an operation unnecessary and yields a better cosmetic result. Moreover, the dose of roentgen rays required is small, and usually a single exposure is sufficient. In cases which do not react promptly to the initial exposure, the treatment may have to be repeated once or twice at intervals depending on the dose given. With such doses there can be no question of cutaneous or general systemic reaction. Therefore, the treatment can be given to weak and febrile patients without danger. These advantages, it would seem, are sufficient to make the treatment well worth a trial. Irradiation during the suppurative stage is less effective, but even then it often relieves pain and may shorten the course of the process to some extent. I do not mean to imply that all lesions of this character respond uniformly to the treatment. A small percentage do not appear to be influenced at all. The reasons will be considered later.

Among the inflammatory lesions included in the preceding reports are furuncle, carbuncle, cellulitis and phlegmon, soft tissue abscesses, paranephric and perinephric abscesses, peridental infection, acute adenitis, onychia and paronychia, orchitis, epididymitis, mastitis, suppurative frontal and maxillary sinusitis and otitis media. The report of Heidenhain [15] (1926) included 855 cases; in 76 per cent of these the patients recovered rapidly without surgical intervention. Doubtful results were obtained in 19 per cent. He found irradiation ineffective in acute osteomyelitis and in cryptogenetic abscesses. The fact that most patients recover promptly without operation does not mean that irradiation should supplant surgical measures. Rather, the surgeon and radiologist must collaborate, because

* From the Section on Therapeutic Radiology, the Mayo Clinic.

* Read before the Section on Radiology at the Eighty-First Annual Session of the American Medical Association, Detroit, June 25, 1930.

1. Coyle, R. R.: Odds and Ends of X-Ray Work, Including Some Cases of Carbuncle, M. Electrol. & Radiol. **7:** 139-142, 1906.
2. Dunham, Kennon: Treatment of Carbuncles by the Roentgen Ray, Am. J. Roentgenol. **3:** 259-260 (May) 1916.
3. Ross, G. G.: X-Ray Treatment of Carbuncle of Face, Ann. Surg. **66:** 99-100 (July) 1917.
4. Richards, C. E.: Some of the Less Common Uses of X-Ray Therapy, J. Radiol. **3:** 271-273 (July) 1922.
5. Lewis, R. W.: A Conservative Treatment of Carbuncles, Ann. Surg. **78:** 649-659 (Nov.) 1923.
6. Hodges, F. M.: The Roentgen Ray in the Treatment of Carbuncles and Other Infections, Am. J. Roentgenol. **11:** 442-445 (May) 1924; Roentgen Ray in Treatment of Local Inflammations, Cellulitis and Carbuncles, J. A. M. A. **85:** 1292-1294 (Oct. 24) 1925.
7. Heidenhain, Lothar; and Fried, Carl: Röntgenbestrahlung und Entzündung, Arch. f. klin. Chir. **133:** 624-655 (April) 1924; Klin. Wchnschr. **3:** 1121-1122 (June) 1924.
8. Pordes, Fritz: Ueber die Natur der Wirkung der Röntgenstrahlen, speziell über das Verschwinden von Anurie nach Nierenbestrahlung, Wien. klin. Wchnschr. **36:** 656-657 (Sept. 13) 1923; Der Mechanismus der Röntgenwirkung: Ein Erklärungsversuch, Fortschr. a. d. Geb. d. Röntgenstrahlen **31:** 287-297, 1923-1924; Ueber Röntgenbehandlung entzündlicher Erkrankungen: Allgemeines und Spezielles, Strahlentherapie **24:** 73-86, 1926.
9. Holzknecht, Guido: Roentgen Treatment of Spontaneous Post-Traumatic and Postoperative Coccus Infections and Suppurations, Am. J. Roentgenol. **15:** 332-336 (April) 1926.
10. Gerber, Isaac: Roentgen-Ray Treatment of Superficial Pyogenic Infections, Rhode Island M. J. **9:** 33-38 (March) 1926.
11. Fraenkel, S. R., and Nissnjewitsch, L. M.: Ueber die Röntgenbehandlung der chirurgischen entzündlichen Vorgänge, Strahlentherapie **24:** 87-100, 1926.
12. Solomon, Iser; and Blondeau, A.: La roentgenthérapie dans les affections inflammatoires, J. de radiol. et d'électrol. **11:** 465-469 (Sept.) 1927. Tillier, in discussion, p. 469.
13. Carp, Louis: Treatment of Carbuncles, Ann. Surg. **86:** 702-706 (Nov.) 1927.
14. Pordes, Fritz: Die Verlaufsänderung akuter Entzündungen nach Röntgenbestrahlung, Strahlentherapie **33:** 147-151, 1929.
15. Heidenhain, Lothar: Röntgenbestrahlung und Entzündung, Strahlentherapie **24:** 37-51, 1926.

in some cases, even when irradiation has had a good effect, it may be necessary or wise to incise and drain a residual collection of pus. Indeed, the surgeon should watch the condition more closely than ever, because the shortening of the inflammatory process may require more prompt, if less extensive, intervention. If the lesions are treated early, however, suppuration may be prevented altogether. The results obtained by Heidenhain have been amply substantiated by Pordes, Holzknecht and others. Holzknecht advised the surgeon not to operate before irradiation and not to be influenced by lymphangitis or septicemia. According to his experience, focal softening does not occur in about a third of the cases.

PNEUMONIA

Few physicians know that treatment by roentgen rays may be invaluable in pneumonia. Musser and Edsall [16] (1905) reported a case of delayed pneumonic resolution in which irradiation was followed by rapid resolution and improvement. Edsall and Pemberton [17] (1906) described three additional cases in which moderate irradiation of the lungs promptly initiated resolution, with corresponding subsidence of the clinical manifestations. They held that the treatment was useless after organization of the pneumonic exudate, and they considered active, continued inflammation, with fever and toxemia, and tuberculosis as contraindications. A. J. and W. A. Quimby [18] (1916) confirmed the experience of Musser, Edsall and Pemberton in twelve cases of delayed resolution and were so impressed by the effect of irradiation that they were impelled to testify that "no pathologic process in the body responds quicker to an x-ray exposure than the nonresolution following pneumonia." Other favorable reports of the influence of roentgen rays on delayed resolution as well as on earlier phases of the pneumonic process have been made by Krost [19] (1925) and Torrey [20] (1927). Others, for example, Heidenhain (1917), Heidenhain and Fried (1924), Kaess [21] (1925), Fried [22] (1926), Holzknecht [9] (1926), Gadjanski [23] (1927), Glas [24] (1927), Fried [25] (1928), Holtz [26] (1929), and Merritt and McPeak [27] (1930), have shown a similar action of irradiation on postoperative pneumonia as well as on pneumonia unrelated to surgical intervention in a large percentage of the cases in which the treatment was given. Hell [28] (1929), on the contrary, was successful in only three of twenty-four cases, but the technical data furnished are not sufficient to explain his failure.

16. Musser, J. H., and Edsall, D. L.: A Study of Metabolism in Leukemia, Under the Influence of the X-Ray, Tr. Assn. Am. Phys. **20:** 294-323, 1905.

17. Edsall, D. L., and Pemberton, Ralph: The Use of the X-Rays in Unresolved Pneumonia, Am. J. M. Sc. **133:** 286-297 (Feb.) 1907.

18. Quimby, A. J., and Quimby, W. A.: Unresolved Pneumonia: Successful Treatment by Roentgen Ray, New York M. J. **103:** 681-683 (April) 1916.

19. Krost, G. N.: Unresolved Pneumonia in Children: Treatment with Roentgen Ray, Am. J. Dis. Child. **30:** 57-71 (July) 1925.

20. Torrey, R. G.: Roentgentherapy in Disorders of the Respiratory Tract, Particularly Those Associated with Enlargement or Persistence of the Thymus Gland, and Those Associated with Unresolved Pneumonic Exudates, S. Clin. N. America **7:** 221-235 (Feb.) 1927.

21. Kaess, F. W.: Röntgenbestrahlung bei postoperativer Pneumonie, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **38:** 509-515, 1924-1925.

22. Fried, Carl: Die Röntgenbestrahlung der postoperativen Pneumonie, Klin. Wchnschr. **5:** 15-18 (Jan. 1) 1926.

23. Gadjanski, B.: Ueber die Radiotherapie der akuten Entzündungen, Serb. Arch. f. d. ges. Med. **4:** 191, 1927-1928.

24. Glas, Karl: Röntgenbehandlung von Lungenstörungen nach Operationen, Wien. klin. Wchnschr. **40:** 1054-1055 (Aug. 18) 1927.

25. Fried, Carl: Die Röntgentherapie der Bronchopneumonie unter besonderer Berücksichtigung der Bronchopneumonia des Kindesalters, Monatschr. f. Kinderh. **38:** 158-162 (Jan.-Feb.) 1928.

26. Holtz, Leopold: Ueber die Behandlung der Pneumonie mit Röntgenstrahlen, Ztschr. f. klin. Med. **109:** 698-713, 1929.

27. Merritt, E. A., and McPeak, E. M.: Roentgen Irradiation in Unresolved Pneumonia, Am. J. Roentgenol. **23:** 45-48 (Jan.) 1930.

28. Hell, Franz: Beitrag zur Röntgenbestrahlung der Lungenentzündung, Strahlentherapie **31:** 786-796, 1929.

TRACHOMA

As is well known, trachoma is characterized by the development of granulations composed largely of lymphocytes. As time goes on, the granulations are gradually replaced by fibrous connective tissue, and the lids become sclerosed and distorted. Mayou [29] (1902 and 1903) recorded the cases of sixteen patients treated with roentgen rays. In the first case the left eye alone was irradiated and completely cured. The right eye, treated with a solution of copper sulphate, improved much less in the same time, but subsequent exposure to roentgen rays completed the cure of this eye also. Five of the remaining fifteen patients were cured permanently, the condition of nine was influenced favorably, and the others were still under treatment at the time of his report. Mayou's experience was corroborated by Stephensen and Walsh [30] (1903), Bettremieux [31] (1903), Cassidy and Rayne [32] (1903), Geyser [33] (1903, 1904), Goldzieher [34] (1904), Pardo [35] (1904), Horniker and Roumanin [36] (1905), Stargardt [37] (1905), Thielemann [38] (1905), Newcomet and Krall [39] (1906), W. F. Coleman [40] (1907), Stargardt [41] (1912), Jacqueau, Lemoine and Arcelin [42] (1920), Rollet and Bussy [43] (1920), Cochard [44] (1921), Meldolesi and Sabbadini [45] (1923), Meldolesi [46] (1924), Lane [47] (1924), Sabbadini [48] (1926) and others. In some of the cases in which the patients were reported to be cured the trachomatous manifestations recurred, but many patients remained free from disease. Moreover, as shown by Cochard,[44] resumption of treatment was followed by rapid regression and disappearance of the recurring lesions, and this led Cochard to the probably sound conclusion that the initial treatment had not been sufficiently thorough or had not been continued long enough. Harman [49] (1905) was the only one to report failure in influencing trachoma, and it is permissible to surmise that his

29. Mayou, M. S.: A Case of Trachoma Treated by X-Rays, Tr. Ophth. Soc. U. Kingdom **22:** 95-96, 1902; The Treatment of Trachoma by the X-Rays, Tr. Ophth. Soc. U. Kingdom **23:** 10-23, 1903.

30. Stephensen, Sydney; and Walsh, Davis: Short Note on the Cure of Trachoma by X-Ray Tube Exposure and by High-Frequency Brush Discharges, Lancet **1:** 237 (Jan.) 1903.

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49. Harman, N. B.: Electrical Treatment of Trachoma, Brit. M. J. **2:** 435 (Aug.) 1905.

technic may have been faulty. Terrien [50] (1919) admitted that irradiation caused the lymphoid hyperplasia to retrogress and the granulations to disappear but claimed that recurrence was the rule. Derby [51] (1924) did not think well of the treatment, but his opinion was based on an incomplete and cursory review of the literature. It is impossible to read the communications of Thielemann (1905), Cochard (1921), and Sabbadini (1926) without being convinced that roentgen rays have a real and substantial effect on the lesions of trachoma. This action is greatest in the early stages of the granular form of the disease; irradiation has little, if any, effect during the later stages when the lymphoid granulations have been replaced by connective tissue. Radium has been shown to have much the same effect by Beck [52] (1905), Cohn [53] (1905), Falta [54] (1905), Birch-Hirschfeld [55] (1905), Zelenkowski [56] (1906) and many others, but the results reported have been less favorable than those obtained with roentgen rays, probably because of the technical difficulty of irradiating uniformly the entire conjunctival surface.

ERYSIPELAS

During the last few years it has been found that erysipelas, when it does not complicate conditions such as diabetes or nephritis, often responds well to radiotherapy, particularly if patients are adults and the treatment is given early. For some reason children, on the whole, do not receive so much benefit. Many adults and some children, however, with moderate irradiation, experience abatement of the fever in from twelve to thirty-six hours, and the disease gradually recedes. After a variable period of improvement or complete disappearance of clinical manifestations, some patients may have recurrence, and renewal of treatment may then prove less effective than at first. By moderate irradiation is meant exposure of the affected area or region to from a third to two thirds of an erythema dose of roentgen rays of medium wavelength, generated at a potential equivalent to a sphere-gap tension of from 120 to 140 peak kilovolts, and filtered through 4 mm. of aluminum. An important point is that the treatment should not be limited to the visible part of the lesion but should extend into the adjacent normal tissues well beyond the perceptible limits of the involved territory.

PAROTITIS

Acute parotitis is an uncommon but sinister complication of certain surgical operations. Its incidence is low in general surgery but higher in operations on the large intestine. The first record of the influence of irradiation on this disease appears to have been made by Heidenhain [15] (1926), who found that the inflammation reacted to irradiation much as do other acute inflammatory processes. Recently, Rankin and Palmer [57] (1930) have found that the disease is from fifteen to twenty times more common after surgical intervention on the colon than after all other operations. The mortality rate as reported by various authors ranges between 35 and 60 per cent, and Rankin and Palmer stated that it depends on the primary condition, on the extent and severity of the operation, and on suppuration of one or both parotid glands. A moderate dose of radium applied soon after the onset of the parotitis (infiltrative stage) caused the inflammatory process to subside in most cases within from twenty-four to forty-eight hours and prevented suppuration; the mortality was correspondingly reduced. Suppuration was only a tenth as common after irradiation by radium as after ordinary methods of treatment. These conclusions were based on twenty cases, in only two of which surgical drainage had to be instituted. A few patients have also been treated with roentgen rays, with equally encouraging results. Radium is preferable in many cases of postoperative parotitis because the treatment can be given without disturbing the patient. Relief from pain and rapidity of regression again are the salient effects of irradiation.

NEPHRITIS

On the assumption that the infiltrative stage of chronic parenchymatous nephritis is characterized by round-cell infiltration around the glomeruli and larger intertubular vessels and that such infiltrating round cells should be susceptible to irradiation, Pescarolo and Quadrone [58] (1907) treated a woman who had chronic nephritis, accompanied by edema of the lower extremities and trunk, ascites and hydrothorax. The condition of the patient began to improve immediately and recovery followed. Galausino [59] (1912) was not so successful, but Stephan [60] (1920), Mühlmann [61] (1923) and Fritsch [62] (1923) reported cases of nephritis with oliguria or anuria and other clinical manifestations of renal insufficiency, in which rapid and marked improvement followed irradiation of the kidneys. Stephan and Mühlmann contended that the rays directly stimulate the renal cells to greater functional activity. Experimental and clinical evidence of such direct stimulation is meager and unimpressive. The only tenable explanations are that the remarkable changes reported are the result of coincidence or, as Pordes and others maintain, of the destruction of infiltrating leukocytes and secondary relief from intrarenal cellular pressure which may be responsible for the oliguria or anuria. If such action should be subsequently proved, irradiation may offer a valuable means of treatment in such cases, but only a certain percentage may be expected to derive benefit, because in nephritis the degree of leukocytic infiltration varies greatly in different cases.

MISCELLANEOUS LESIONS

Exposure to small or moderate doses of roentgen rays has been found to yield equally good results in many other inflammatory lesions. Pordes (1926) thus treated many patients with inflammation of the dental

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52. Beck: Radium in trachoma, Ann. Ophth. **14**: 478-481, 1905.
53. Cohn, Hermann: Die Heilung des Trachoms durch Radium, Berl. klin. Wchnschr. **1**: 22 (Jan.) 1905.
54. Falta, M.: Das Radium in der Trachomtherapie, Wien. med. Wchnschr. **55**: 1546-1551, 1905.
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57. Rankin, F. W., and Palmer, B. M.: Radium in the Treatment of Postoperative Parotitis, Ann. Surg., to be published.
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59. Galausino, Diego: Dell-azione curativa dei raggi X nelle nefrite, Policlinico (sez. prat.) **19**: 77-79 (Jan. 14) 1912.
60. Stephan, Richard: Ueber die Steigerung der Zellfunktion durch Röntgenenergie, Strahlentherapie **11**: 517-562, 1920.
61. Mühlmann: Ueber Röntgenreizbestrahlung, Strahlentherapie **15**: 646-649, 1923.
62. Fritsch, Hans: Zur Behandlung der Urämie bei akuter Nephritis mit Röntgenstrahlen, München. med. Wchnschr. **1**: 841-843 (June 29) 1923.

periosteum. As usual, he found that the more acute the process the better the prognosis. Wagner [63] (1926) reported the results obtained with moderate doses of roentgen rays in 350 cases of acute, subacute or chronic inflammation of the female genital structures. Two hundred and sixteen of these cases were traced. Exceptionally favorable results were obtained in almost all cases of the puerperal form of parametritis and gonorrheal infection. In 8 per cent of the cases the patients, most of whom were elderly, did not derive any benefit, and in 10 per cent of the cases the improvement was preceded by a temporary exacerbation of symptoms. Solomon and Blondeau (1927) treated four patients suffering from puerperal septicemia, but the fact that other treatment was given at the same time made it difficult to decide whether their rapid recovery was due to irradiation. Gambarow [64] reported 123 cases of inflammation of the adnexa in which treatment was carried out by exposure to small doses of roentgen rays; he claimed extremely good results. Tillier [13] found that irradiation had considerable effect on the lesions of anthrax and mentioned a case in which two surgical operations had failed to control the disease, which subsided and healed promptly after roentgen treatment. Goldmann [65] (1929) obtained similarly favorable results in cases of acute inflammation of the middle ear. The symptoms in some cases increased for a few hours but then subsided rapidly, and the course of the process was distinctly shortened.

The evidence of the therapeutic value of irradiation in inflammatory processes is so abundant and the testimony is so generally favorable that one wonders why irradiation is not used more than it is. Perhaps the very multiplicity of inflammatory lesions in which radiotherapy has been claimed to be effective has led to a not unnatural skepticism. Or, again, failure to utilize the treatment may be due to the excessive fear of ill effects, a fear springing probably from the reading of reports of injury, occurring during treatment for malignant tumors with large doses of irradiation, or of the systemic reaction which so often follows irradiation for lesions requiring prolonged exposure. However, the treatment of inflammatory processes, especially the acute conditions, is an entirely different affair, as will appear presently.

TECHNIC

Although some variation in dosage is to be found in the communications of different authors, the most noteworthy feature of such work is that the dose of rays is small or moderate. If the dose necessary to cause erythema of the skin is taken as 100 per cent, the dose for acute and subacute inflammations is generally less than 50 per cent and sometimes less than 25 per cent. Certain physicians have used doses varying between 40 and 80 per cent of the limit of tolerance of the skin, but the weight of evidence indicates that smaller doses, ranging between 10 and 50 per cent of the erythema dose, are preferable. The results obtained with doses approaching the limit of tolerance of the skin do not appear to be as good as those which follow smaller doses. Heidenhain, Pordes, Holzknecht and others advocate doses between 10 and 20 per cent. Such a dose of roentgen rays cannot cause any reaction of the normal skin or of the system as a whole, and the treatment, therefore, is free from the anorexia, nausea and vomiting, which often follow exposure to maximal doses. A single exposure of a few minutes is sufficient if the lesion can be irradiated through a single field. In some cases the treatment may have to be repeated once or twice at intervals of from four to six or eight days, but if the inflammatory process does not respond to three separate irradiations it is not likely to yield at all. This, however, does not apply to certain chronic infectious processes, such as tuberculous adenitis or peritonitis, actinomycosis or blastomycosis; these require repeated treatment for some time. Other significant points are that the results are best when the lesions are treated early and that treatment should not be confined to the area visibly or palpably affected but should extend well beyond such limits and include an adjacent zone of normal territory.

MODE OF ACTION OF IRRADIATION

Various explanations have been advanced to account for the influence of the rays on inflammatory conditions, and the very multiplicity of such explanations probably has led many physicians to discredit the clinical evidence or to ascribe it either to overenthusiasm or to psychic factors. Indeed, without a satisfactory and convincing explanation it would be difficult to believe that the same agent could be therapeutically effective against so many different forms of inflammation in different organs or parts of the body. And yet the reason appears to be quite simple and rests on sound and abundant experimental evidence. The natural tendency would be to think that the effect of the rays on inflammatory lesions may be due to a bactericidal action on the infecting organisms, but the almost constantly negative results of the large number of experiments undertaken to test the direct influence of irradiation on many kinds of bacteria renders such an hypothesis untenable. Since irradiation acts in much the same way and in almost exactly the same time on so many forms of acute inflammation, it is obvious that the inflammatory lesions must have some common factor. What may this factor be? The answer to this question appears to be provided by the results of the experiments of Heineke [66] (1903-1905), Warthin [67] (1906), Krause and Ziegler [68] (1906-1907), Fromme [69] (1917), Hall and Whipple [70] (1919), Hartmann [71] (1920), Warren and Whipple [72] (1922), Jolly [73] (1924), Tsuzuki [74] (1926), Piepenborn [75] (1929) and others.

63. Wagner, G. A.: Die Röntgentherapie der entzündlichen Erkrankungen in der Gynäkologie, Strahlentherapie **24**: 52-72, 1926.
64. Gambarow, G.: Strahlentherapie der entzündlichen Adnexerkrankungen, Strahlentherapie **26**: 698-705, 1927.
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66. Heineke, H.: Ueber die Einwirkung der Röntgenstrahlen auf Tiere, München. med. Wchnschr. **1**: 2090-2092, 1903; Zur Kenntnis der Wirkung der Radiumstrahlen auf tierische Gewebe, ibid. **2**: 1383-1384 (Aug.) 1904; Experimentelle Untersuchungen über die Einwirkung der Röntgenstrahlen auf innere Organe, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **14**: 21-94, 1905.
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74. Tsuzuki, Masao: Experimental Studies on the Biological Action of Hard Roentgen Rays, Am. J. Roentgenol. **16**: 134-150 (Aug.) 1926.
75. Piepenborn, Jurgen: Versuche über den Wirkungsgrad von Röntgenstrahlen verschiedener Wellenlänge auf die Milz der Mans, bei gleicher Dosis, gemessen in R-Einheiten, Strahlentherapie **33**: 322-327, 1929.

Heineke (1903-1905) was one of the first to make a breach in the wall of obscurity which, until that time, had surrounded the action of irradiation on living cells. The most important result of his experiments on a large number of white mice, rats, guinea-pigs, rabbits and dogs was to reveal the exceptional sensitiveness of lymphocytes to roentgen rays and radium. Heineke found that, when the entire body of animals of different species was exposed to large doses of one or the other form of radiant energy, the animals invariably died after an interval which varied according to the dose of rays and the size and age of the animals. Regardless of the ability of the animals to tolerate irradiation, however, he observed at necropsy that, although the majority of the organs were free from perceptible abnormality, the spleen, mesenteric and other lymph nodes and intestinal lymph follicles showed marked destruction of lymphocytes, and the degree of cellular disintegration varied according to the dose of rays and the interval between irradiation and microscopic examination. As the number of intact lymphocytes diminished, the stroma became more and more prominent. The lymphocytic degeneration in the spleen and lymph nodes was often so great that most of the malpighian corpuscles or lymphoid follicles disappeared as such and could be recognized only by the blood vessels and by the concentric arrangement of the stroma of these structures. The destruction of lymphocytes was found to begin about two hours after irradiation and to be characterized by disorganization and fragmentation of the nuclear chromatin of the cells and scattering of the fragments of chromatin between the remaining intact cells and in the spaces of the reticular stroma, where the fragments gathered into clumps or balls. The result was almost complete destruction of the lymphoid tissue in about twenty-four hours, and this was accompanied and followed by progressive reduction in volume or atrophy of the affected structures. Then the clumps or balls of degenerate chromatin were gradually taken up by some of the reticular cells, which thus assumed a phagocytic property and swelled as the amount of ingested chromatin débris increased. The same changes were observed in the spleen, mesenteric lymph nodes, solitary follicles of the intestine, lymphoid tissue of the vermiform appendix, and even bone marrow.

The phagocytic disposal of the degenerate nuclear chromatin continued until the lymphocytes in the follicles were largely destroyed, but a small percentage of these cells appeared to resist the action of the rays. After a number of hours the phagocytic reticular cells themselves began to disappear; the chromatin débris ingested by the phagocytes appeared to undergo intracellular digestion, because the number and size of the ingested fragments diminished steadily. All that remained after the phagocytes had disappeared was the connective tissue framework, the blood vessels and a number of round cells with a bright nucleus. Two or three days after exposure to roentgen rays, degenerative alteration of other cells, notably the polymorphonuclear leukocytes and eosinophils, also became perceptible, and many of these cells disappeared from the splenic pulp and bone marrow. The degree of lymphocytic destruction appeared proportional to the length of exposure to the rays, and Heineke attributed the difference noted in the degree of the changes in the tissue to variation in the focal-skin distance and in the thickness of the intervening tissues. In other animals irradiated for varying periods and examined from ten days to three weeks later, more or less regeneration of the lymphoid tissue was observed.

Warthin's description of the effect of roentgen rays on the lymphoid structures corroborates the observations of Heineke in every particular, except that, by examining the tissues soon after irradiation, Warthin found unmistakable evidence of the distintegration of lymphocytes within fifteen minutes after exposure of the animals to the rays, and the cellular degeneration continued for several days. Similar effects were obtained with radium by London [76] (1903), Heineke (1904), London [77] (1905), Thies [78] (1905) and Lazarus-Barlow [79] (1922). Rudberg,[80] Aubertin and Bordet,[81] Arella,[82] Regaud and Crémieu [83] and many others have likewise shown that roentgen and radium rays exert precisely the same influence on the small round cells of the thymus gland, and their work strongly supports Hammar's conclusion that the small cells of the thymus gland are indeed lymphocytes. Others, notably Senn [84] (1903), Heineke [66] (1903, 1905), Guilloz and Spillmann [85] (1904), Aubertin and Beaujard [86] (1904, 1905, 1908), Brown [87] (1904), Bryant and Crane [88] (1904), Capps and Smith [89] (1904), Helber and Linser [90] (1905), Benjamin, von Reuss, Sluka and Schwarz [91] (1906), Aubertin and Delamarre [92] (1908), Taylor, Witherbee, and Murphy [93] (1919), Russ [94] (1919, 1921), and Leitch [95] (1921), proved conclusively that the lymphocytes in the circulating blood are equally sensitive to irradiation and also are destroyed in large numbers by exposure to roentgen or radium rays.

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95. Leitch, A.: The Immediate Effects of X-Rays on the Blood Lymphocytes, Arch. Radiol. & Electroth. **26:** 122-128 (Sept.) 1921.

These facts have long since established the exceptional radiosensitiveness of lymphocytes, but how may this be related to the influence of roentgen rays and radium on inflammatory processes? All the clinical circumstances indicate that inflammatory lesions respond to irradiation in proportion to the degree of leukocytic infiltration, and that the rays act primarily by destroying the infiltrating cells. In favor of this view held by Pordes and others are, on the one hand, the experimentally proved radiosensitiveness of lymphocytes, and, on the other hand, the fact that the rate of regression of many acute inflammatory lesions corresponds to the rate at which lymphocytes are known to be destroyed by irradiation. In this connection it is interesting to analyze some of the explanations previously advanced. At the time Musser, Edsall and Pemberton tested the therapeutic value of roentgen rays for delayed pneumonic resolution, ferments occupied an excessively prominent place in biologic and medical thought, and they expressed the idea that the rays act on the pneumonic process by accelerating the action of ferments and stimulating autolysis, but they admitted the "widespread and excited tendency to give ferments a more important place than is their due." A. J. and W. A. Quimby attributed the effect to destruction of leukocytes infiltrating the lungs. Krost thought that irradiation stimulated phagocytosis. These various interpretations appear more divergent than they really are. Although absolute proof is lacking, it seems probable that the activation in ferment action and autolysis invoked by Musser, Edsall and Pemberton, the destruction of infiltrating leukocytes mentioned by A. J. and W. A. Quimby, and the increase in phagocytosis referred to by Krost represent only different phases of the same effect. The destruction of large numbers of lymphocytes soon after moderate irradiation and the phagocytosis of the nuclear débris of the destroyed cells undoubtedly explain the increase in phagocytosis and autolysis and the failure of irradiation after the onset of organization. In trachoma, Mayou thought that the effect on the granulations was due to leukocytosis induced by the rays. Sabbadini's microscopic studies seem to prove that the main effect of irradiation on the granulations is to destroy lymphocytes, and this is in harmony with the clinical observation that the effect is greatest in the infiltrative stages of the granular form of the disease and that the rays have little, if any, influence when the inflammation has been present a long time and the granulations have been replaced by connective tissue sclerosis.

In erysipelas and parotitis the mechanism by which the rays exert their beneficial influence has not yet been clearly established, but the significant rôle of lymphocytes in the defense of the organism against infection and the great sensitiveness of these cells to irradiation make it appear likely that, in this condition, as in so many other inflammatory processes, the rays act by destroying lymphocytes infiltrating the lesion or circulating in the blood vessels which supply the affected area. In favor of this view is the rapidity with which the symptoms often abate and the physical signs disappear after exposure to a small or moderate dose of roentgen rays or radium. This in itself points to destruction of lymphocytes as at least the primary and direct result of irradiation, because the lymphocytes are the only cells in the body, except those of the basal epithelium of the salivary glands, which react to irradiation at anything approaching this rate. Also variation in the degree of leukocytic infiltration in different patients may explain the partial or complete failure of irradiation in some cases.

Schaefer[96] (1927), Motojima[97] (1928) and Lacassagne and Vinzent[98] (1929) have shown by experiments on animals that exposure of acute focal infections to a small or moderate dose of roentgen rays favorably altered the behavior of the lesions, which healed rapidly, whereas similar lesions in the control animals usually led to death. Lacassagne and Vinzent found that irradiation six days after inoculation gave the best results. This question of the interval between the onset of the inflammation and irradiation naturally must vary somewhat with the variety of inflammation and the dose of rays; in human beings the earlier the treatment the better the result. Heidenhain and Fried apparently were able to demonstrate an increase in the bactericidal power of the blood after irradiation of acute inflammatory processes, but Fraenkel and Nissnjewitsch could not substantiate this observation. Bazy (1928) showed that large doses of roentgen rays not only remain ineffectual but may actually increase the inflammatory process.

One of the earliest and most important steps in the natural defense of the organism against most infectious processes is leukocytic, and especially lymphocytic, infiltration around the site of infection. Therefore, when an inflammatory lesion is irradiated, destruction of the infiltrating lymphocytes is to be expected. But since leukocytic infiltration is such an important factor in the defense against infection, the question naturally arises why the destruction of a large number of the lymphocytes infiltrating such lesions may not do more harm than good. The only answer is that no one has yet submitted any evidence of such ill effect after small or moderate doses. Always the influence of irradiation has been favorable or the rays have failed to alter the course of the inflammatory process. When I first attempted to ascertain the therapeutic value of irradiation for lesions of this character this question was uppermost in my mind, and I carefully analyzed all the known experimental and clinical facts. The first patients were treated with great caution. Now, after treating a large number of patients over a period of several years, I can testify that if, in some cases, radiotherapy remains without favorable effect, it has never had an unfavorable action. Moreover, the majority of patients who have been benefited have been given a small or moderate dose of rays of medium quality. Large doses of rays of short wavelength are not required and are indeed undesirable.

How may such an apparent paradox be explained? If it can be assumed that the leukocytes, and especially the lymphocytes, which the organism mobilizes around the site of infection, represent an effort to localize the infection and to get rid of the infectious material by phagocytosis or otherwise, it must also be assumed that the infiltrating cells contain or elaborate within themselves the protective substances or other means which enable them to destroy or neutralize the bacterial or other toxic products which give rise to the defensive inflammation. If these assumptions are well founded, it seems not unreasonable to deduce that irradiation, by destroying the infiltrating lymphocytes, causes the protective sub-

96. Schaefer, Walter: Experimentelle Untersuchungen über die Wirkung der Röntgenstrahlen auf bakterielle Entzündungen, Strahlentherapie **25**: 370-372, 1927.

97. Motojima, Ryunosuke: Experimentelle Untersuchungen über den Einfluss der Röntgenstrahlen auf den Ablauf von Entzündungen im Vergleich mit anderen physikalischen Methoden, Strahlentherapie **29**: 30-70, 1928.

98. Lacassagne, A., and Vinzent, R.: Action des rayons X sur un foyer infectieux local, provoqué chez le lapin par l'injection de Streptobacillus caviae, Compt. rend. Soc. de biol. **100**: 247-249 (Jan. 26) 1929.

stances contained by such cells to be liberated and to be made even more readily available for defensive purposes than they were in the intact cells. There can be little question that the rays act by destroying the infiltrating leukocytes and that the value of radiotherapy depends chiefly on such action. In favor of this view are the points already mentioned; namely, that the rapidity of recession of irradiated inflammatory lesions corresponds to the rate at which the normal lymphocytes are known to be influenced by exposure to the rays, and that a small or moderate dose of irradiation is sufficient or even preferable to a large dose. Other circumstances pointing in the same direction are that radiotherapy is most beneficial during the infiltrative stage and less beneficial during the suppurative stage (even then, some benefit may be derived) of the inflammatory process, and that, although many such lesions respond rapidly to treatment of this kind, some respond less rapidly or do not respond at all. In connection with the last point, variation in the degree of leukocytic infiltration of different lesions of the same character or of similar lesions of different character is a well known pathologic fact. Therefore, the degree of leukocytic infiltration must influence the action of the rays, because the rays can destroy lymphocytes only in proportion to the number of such cells. This is undoubtedly related to and probably explains the fact that, while many inflammatory lesions are influenced favorably by irradiation, some react much less or fail to show any reaction.

ABSTRACT OF DISCUSSION

DR. ROLLIN H. STEVENS, Detroit: I am particularly grateful to Dr. Desjardins for the presentation of this timely paper with such a complete reference to the literature extending from the date of very early experimental roentgen work down to the past year. All who have been doing therapy can confirm the beneficial action of roentgen rays in many acute and chronic infections, but probably few have extended their therapeutic field to the treatment of erysipelas, parotitis, puerperal septicemia, parametritis, gonorrheal infections, nephritis and trachoma. There is no good reason why these diseases may not be favorably influenced by roentgen rays, and certainly no harm could be done by treating them with light, not too frequently repeated, doses. The roentgen treatment of furuncles and carbuncles is, I believe, the treatment of choice. If given early, as suggested, little if any surgery is necessary. It relieves pain and limits and diminishes rapidly the inflammatory and metastatic processes, whereas early surgery is likely to result in extension and metastasis. Dr. Desjardin's theory of the action of roentgen rays by destroying friendly infiltrating lymphocytes and thus setting free their protective materials in larger quantities in a given time is interesting and rational but not entirely convincing. The time is too limited to discuss this important phase of the paper as it should be, but it has been demonstrated by several investigators that, after light or moderate irradiation, changes take place in many other and more radioresistant types of cells than lymphocytes, and these changes do not affect their form or appearance, but their subsequent development shows that they carry within themselves a latent lesion, which is manifest in abortive or monstrous evolution. This must mean a change in cell metabolism and secretion. Each cell is a small complicated laboratory in itself. Its secretions undoubtedly affect surrounding and distant groups of cells and change the electrocolloidal chemistry of the body fluids about which so little is known. Regaud and Lacassagne state that in certain unicellular organisms the dissociation between conserved mobility and the infecting power suppressed by irradiation has been affirmed in particular in trypanosomes and in different bacteria. It is a complicated question and demands an immense amount of research before it can be satisfactorily answered. The paper has certainly opened up a large field for investigation.

DR. H. J. ULLMAN, Santa Barbara, Calif.: If any one has not treated furuncles with the roentgen ray, I would suggest that he do so on the next small furuncle on the back of the neck. A dose with the following factors, 26 cm. distance, about 2.5 cm. circle for port, 120 kilovolts at 5 milliamperes, with 3 mm. of aluminum as filter, for five minutes, which is approximately 50 per cent of the suberythema dose, will abort this furuncle in practically every instance. I have treated one case of nephritis but am sorry that I do not remember the details. This patient was given 30 milliampere minutes, through a port 9 cm. square over the kidneys, at 200 kilovolts, with 0.5 mm. of copper and 1 mm. of aluminum as filter, 50 cm. distance, once a week for two or three times. He had marked relief of his symptoms. It is the only such case I have treated. I should like to ask Dr. Desjardins if he will explain the action on herpes facialis of unfiltered x-rays. I am assuming, of course, that it is a trophic nerve condition. One-half skin unit delivered to a herpes will stop it at exactly that point; it will not progress farther. It usually remains stationary from twenty-four to forty-eight hours and then disappears. I have done it a number of times on myself and on patients with one-half unit unfiltered.

DR. EDWIN C. ERNST, St. Louis: Small doses of x-rays are preferable to heavy doses. I believe that I have seen patients to whom I gave too large a dose. It did no particular harm except that the patient failed to show any evidence of improvement. On the question of inflammatory conditions, eight or nine years ago there were two cases that came to my attention in which there was a question of a malignant growth of the liver. There was no definite information from the standpoint of a pathologic diagnosis, no operation had been performed, but the patients had large livers and there was a considerable jaundice. Both of these patients are living today, I believe, and are in the best of health. This was eight years ago. I began treatment from the standpoint of treating the malignant growth with small doses. It was experimental at that time. The patients would not allow operation. Both of these men I saw no less than two or three months ago. They were perfectly well and have shown no evidence of jaundice. They were jaundiced to the—I would say practically to the last degree. At different times I was interested in taking up this subject but was reluctant to do so on account of the usual conception that, of course, operative procedure is indicated. I believe that there are some possibilities in it that might be taken up when the condition arises in which an operation is out of the question. During the war I treated about fifty cases of lung abscesses, and I am sure that many physicians here have had some experience along that line. Out of that series, twenty patients reacted brilliantly and to my surprise patients in whom the abscess was practically incurable to the extent that the patient was gradually becoming weaker and weaker and the S O S signal was sent out that they would be sent to blighty at the first opportunity, promptly reacted, even to the small machines used in the war. In those in whom there were no definite initial reactions, it did not seem to alter the course; so that I believe there are many possibilities in mild inflammatory conditions in the acute stage that can be effected.

DR. L. T. LE WALD, New York: I should like to ask Dr. Desjardins to say a word more about peridental infection. I paid no particular attention to this question until I noticed Dr. Desjardins' discussion in the Mayo *Bulletin* a few weeks ago. At that time a patient was referred to me by a dentist. There were two rather limited peridental infections, and I was asked whether ultraviolet rays would be of help. I knew the dentists were using ultraviolet rays a great deal because at the dental school I had seen them do that after extraction of infected teeth. Based on Dr. Desjardins' discussion I advised x-rays instead of ultraviolet rays and, although it is only a short time, there seems to be some improvement. It would be interesting to know whether he has had some evidence along this line.

DR. A. U. DESJARDINS, Rochester, Minn.: There are only two points that I want to stress again. One is the advantage of using small rather than large doses, because too large doses can aggravate the process instead of reducing it. Dr. Ullmann asked about herpes. I have had experience with a number of cases of herpes, some of which improved when the peripheral lesion was irradiated and others improved when I irradiated the roots of the nerve. As far as I could analyze the cases, the effect appears to depend on the extent of the lesion. If the

lesions follow the nerve some distance, I generally prefer to irradiate the roots of the nerve. When there is only a small group of lesions in a certain part of the body, I irradiate the affected area. It is impossible to say definitely just how the rays work. It may be that the rays act on the leukocytic infiltration; this would explain why some cases derive rapid and marked benefit, while others do not. My experience with peridental infection has been limited. I have not treated all forms of peridental infection. I have treated, for instance, the swelling that comes after the extraction of one or more teeth, and such inflammation subsides rapidly. The pain often disappears over night, and the next morning the patient is quite all right. Sometimes resolution requires forty-eight instead of twenty-four hours. In chronic inflammation of the nature of pyorrhea the effect of irradiation is bound to be slow, because the infection has been present a long time and the inflammatory exudate is partly organized. It seems likely that the infecting organism also plays a part in the effect of irradiation. The fact that streptococcic infection often causes little or no leukocytic infiltration may explain why, except in erysipelas, inflammatory lesions of this character do not respond so well, on the whole, as lesions caused by the staphylococcus.

INDICATIONS AND CONTRAINDICATIONS OF ENCEPHALOGRAPHY AND VENTRICULOGRAPHY *

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Many brain lesions give few or no localizing signs, even though they have been subjected to repeated thorough neurologic examinations. Dandy [1] states that approximately 40 per cent of brain tumors can be localized by neurologic methods and that assistance from the routine roentgen examinations of the head may be expected in only 10 to 15 per cent of the cases. Frazier [2] feels that Dandy's percentage of localization of brain tumors by neurologic methods is too low. He states that his percentage of localization is from 60 to 70 per cent by neurologic examinations without the aid of the roentgen examination. Cohen,[3] working in our laboratory, analyzed 221 cases of patients suffering from brain tumors who had been referred to us by the neurologic and neurosurgical divisions of the University Hospital for roentgen examinations of the head. The tumors of these patients were distributed as follows: Ninety-seven in the cerebrum, sixty-five in and around the pituitary fossa, and fifty-nine in the cerebellum. All of these patients had the usual neurologic and roentgen examinations. In addition, all were operated on and a microscopic verification of the tumor was substantiated.

In the sixty-five cases of pituitary lesions, it was possible to make a correct clinical diagnosis in fifty-five cases, or 84.6 per cent. The roentgen diagnosis was accurate in fifty-eight cases, or 90 per cent. Correlation of the clinical and roentgenographic observations raised the percentage of accurate diagnosis and localization to sixty-four cases, or 98.5 per cent.

In the group of ninety-seven cases of cerebral tumors, forty-six cases, or 47.4 per cent, were diagnosed clinically, and of this number thirty-two cases, or 33 per cent, were accurately localized. There was roentgen evidence of increased intracranial pressure in fifty-five cases, or 56.7 per cent; and in twenty-six cases, or 26.8 per cent, the tumor was localized.

In the group of fifty-nine cerebellar tumors, forty-eight, or 81.4 per cent, were correctly localized by clinical examinations. The roentgen diagnosis was of localizing value in thirty cases, or 50.8 per cent.

It is appreciated, therefore, that even in brain tumors there is an urgent need for more accurate methods of localizing the lesion since the mortality from unlocalized brain tumors is 100 per cent. There are a number of other brain lesions that do not give localizing signs and, if they do, sometimes simulate brain tumors, and still others that do not give any positive neurologic signs. In an effort to diagnose and localize the various brain lesions more accurately, Dandy,[4] in 1918-1919, was the first to describe and popularize two procedures —ventriculography and encephalography.

VENTRICULOGRAPHY

Ventriculography is a procedure in which a series of properly exposed roentgenograms are made of the head in several positions in the horizontal posture within one hour following the removal of all the available cerebrospinal fluid from the ventricles of the brain and its replacement by air.

Technic.—The operative technic has been described many times by other authors and will not be discussed here except to state that two small trephine openings are made in the skull a few centimeters above and lateral to the occipital protuberance. A needle is introduced into the posterior horn of each ventricle and the cerebrospinal fluid is allowed to drain off, the head being manipulated and rotated to allow complete drainage. Intermittent gentle pressure over the jugular veins is of value and helps in more complete drainage. As the fluid drains from the ventricles, it is replaced with air by aspiration.

In a previous paper I [5] described the roentgenographic technic which I employ. A Bucky diaphragm is so arranged as to be placed above the head of the patient to be examined, with the Coolidge tube below the table. This allows one to place the ventricle containing the maximum amount of air next to the film, thereby causing less distortion and allowing greater ease of interpretation. Stereoscopic roentgenograms are made of each side of the head and in addition anteroposterior and postero-anterior roentgenograms. In the latter it is essential to flex the chin on the chest in order that the frontal sinuses may not be superimposed on the ventricles.

Indications.—In the presence of increased intracranial pressure, ventriculography is the procedure of choice in cases in which the most careful roentgenologic, ophthalmologic and neurologic methods fail to demonstrate satisfactory localizing signs of the lesion. This would include unlocalized brain tumors, brain abscess, basal arachnoiditis or any condition causing a block of the ventricular system. The unlocalized brain tumors are usually located in the frontal lobes or the midline; some are located in the occipital lobes and the posterior fossa. It is important for the surgeon to know whether he is dealing with a supratentorial or infratentorial lesion, because his approach is entirely different. The size of the lesion is of importance to the surgeon as it helps him to plan the surgical approach.

* From the Department of Roentgenology, Hospital of the University of Pennsylvania.

* Read before the Section on Radiology at the Eighty-First Annual Session of the American Medical Association, Detroit, June 26, 1930.

1. Dandy, W. E.: Localization of Brain Tumors by Cerebral Pneumography, Am. J. Roentgenol. **10:** 610-616 (Aug.) 1923.
2. Frazier, C. H.: Brain Tumors, Progr. Med., 1924, pp. 18-25.
3. Cohen, J. G.: Personal communication to the author. Paper to be published.
4. Dandy, W. E.: Ventriculography Following the Injection of Air into the Cerebral Ventricles, Ann. Surg. **68:** 569 (Dec.) 1918; Roentgenography of the Brain After the Injection of Air into the Spinal Canal, ibid. **70:** 397 (Oct.) 1919.
5. Pendergrass, E. P.: A New Arrangement of the Bucky Diaphragm for Ventriculography, Am. J. Roentgenol. **17:** 358 (March) 1927.

Ventriculography originally was used by Dandy to demonstrate the size of ventricles in hydrocephalus and to indicate the point of obstruction.

In order to make a diagnosis of the lesion after ventriculography, the lesion must be located so as to deform or block the ventricular system. It is essential, therefore, that one should be familiar with the roentgenologic anatomy of the brain and be able to use the stereoscope.

Contraindications.—Patients who have unlocalized brain tumors or other lesions without increased intracranial pressure should not be subjected to ventriculography because of the high mortality associated with the procedure. According to Grant,[6] it is at least 8 per cent, although in a recent paper he [7] states that in experienced hands ventriculography is not a hazardous procedure.

Errors in Technic.—Failure to get satisfactory roentgenograms is scarcely excusable. Rotation of the head of an uncooperative patient should be guarded against, otherwise it is difficult to interpret the roentgenograms. Failure to drain the ventricles is also regarded as an error in technic and I do not attempt to interpret such roentgenograms, as one is more likely to err rather than make a correct interpretation. It is difficult to interpret the roentgenograms even when the technic has been satisfactory, and the roentgenologist who makes a wrong interpretation on roentgenograms after faulty surgical technic not only does harm to the patient but, in his attempt to do the impossible, gives a false impression of the procedure and his ability to make a correct diagnosis.

Sometimes it is impossible to find the ventricles for surgical drainage due to some abnormality or displacement of the posterior horns. Obviously, in these cases roentgenograms are of no value.

ENCEPHALOGRAPHY

Encephalography is a procedure in which a series of properly exposed roentgenograms are made of the head in several positions in the erect posture within one hour following the removal of all the available cerebrospinal fluid and its replacement with air by the cisternal or lumbar route.

Technic.—The success or failure of this procedure depends on the neurologist, the neurosurgeon and the roentgenologist. The neurologist or neurosurgeon must drain off all available cerebrospinal fluid and the roentgenologist must make technically perfect roentgenograms.

The technic of drainage of the spinal fluid has been described by Pancoast and Fay.[8] Briefly, it consists of inserting two needles in the spaces between the fourth and the fifth lumbar vertebra, the patient being placed first in the horizontal lateral position. If the intracranial pressure is not too high, the patient is then placed in the sitting posture, and the canal is slowly drained and air replaced, the drainage of the fluid and replacement with air being performed according to a pressure per pressure mechanism, rather than volume per volume. The head is manipulated so as to insure the maximum amount of drainage of the ventricles.

After complete drainage, I make stereoscopic roentgenograms of each side of the head and also anteroposterior and postero-anterior views, the examination being made in the erect posture, as previously described by me.[9] Roentgenograms made in the horizontal posture are not encephalograms.

Indications.—The indications for encephalography include cases in which the symptoms are obscure, such as those following trauma, inflammation and senility, epilepsy, hemorrhage, tumors of the brain, hemiplegia and birth injuries. As encephalography is the replacement of cerebrospinal fluid by air introduced into the subarachnoid spaces surrounding the brain and within its ventricles, it is evident that encephalography is indicated in any condition of the brain or its surrounding structures that would distort or obliterate the subarachnoid fluid pathways. Many of these conditions cause few or obscured symptoms and much information of importance has been obtained from employing this method. The procedure is thought by some to be of distinct value in relieving post-traumatic headache. This has been explained as due to stretching of the subarachnoid membrane. Others feel that the improvement is due to the removal of the cerebrospinal fluid.

Contraindications.—The procedure is contraindicated in all patients having a pressure of 20 mm. of mercury or more in the horizontal lateral position. Lumbar puncture in such persons may cause a foraminal hernia of the posterior cerebellar hemispheres. Any obstruction of the ventricular system in the region of the third ventricle, aqueduct of Sylvius and the fourth ventricle, such as is found in tumors in any of these regions or from outside pressure, will cause a considerable increase in the intracranial pressure. It is therefore essential that careful neurologic studies be made to exclude any of the possibilities mentioned before one is justified in suggesting encephalography as a diagnostic measure.

Errors in Technic.—I [10] have outlined several points that should be stressed with regard to the interpretation of encephalograms which may be considered under this heading.

Occasionally one will find a complete absence of filling of the ventricles with air in the encephalogram. This usually means that the surgical technic or drainage of the cerebrospinal fluid and replacement with air was not adequate and therefore should be regarded as an error in technic unless one has strong clinical evidence to the contrary. I have noticed that the absence of filling of the ventricles is almost proportional to the experience of the operator. The inexperienced operator is satisfied with much less manipulation of the head than the experienced. If a roentgenogram is made twenty-four hours later, the ventricles may contain air which would exclude a pathologic lesion occluding the foramina of Luschka and Magendie. Some of my confrères have stated that they believed the absence of filling in such cases was due to a collapse of the cortex into the ventricles preventing their filling. I feel that I have proved that this is not the case because of the fact that in advanced cortical atrophy of external hydrocephalus there is no deformation of the ventricles. Another explanation may be that suggested by Bateman,[11] who says that he has demonstrated a membrane that is not permeable. If this type of membrane covered the foramina of Luschka or Magendie, the absence of the filling of the ventricles could be explained. There are still other physiologists who do not believe that there are normal openings or foramina such as described by

6. Grant, F. C.: Ventriculography, Arch. Neurol. & Psychiat. **14**: 513-522 (Oct.) 1925.
7. Grant, F. C.: Ventriculography, Surg. Clin. N. America **8**: 927-940 (Aug.) 1928.
8. Pancoast, H. K., and Fay, T. S.: Encephalography: Roentgenological and Clinical Considerations for Its Use, Am. J. Roentgenol. **21**: 421 (May) 1929.
9. Pendergrass, E. P.: New Arrangement of the Bucky Diaphragm for Encephalography, Am. J. Roentgenol. **19**: 482 (May) 1928.
10. Pendergrass, E. P.: Interpretations of Encephalographic Observations, Arch. Neurol. & Psychiat. **23**: 946-984 (May) 1930.
11. Bateman, J. F.: Closed Foramina of Luschka in the Brains of Insane Persons: Their Influence on the Pathogenesis of the Psychoses, Arch. Neurol. & Psychiat. **14**: 616 (Nov.) 1925.

Luschka and Magendie, and that when it is found it is produced by trauma. The explanation of filling of the ventricles is possibly explained by the fact that the withdrawal of fluid by the lumbar route causes a rupture of the thin membrane, which in turn allows the air to enter the ventricles.

There is still another encephalographic finding which has been attributed to an error in technic, and that is the filling of only one lateral ventricle. Except in the presence of strong clinical data and a displacement of the midline structures, this is always regarded as an error in technic due to insufficient manipulation. A roentgenogram made the next day usually shows a filling of the other ventricle.

Encephalograms should be made in the erect posture within an hour after the introduction of the air, the patient having been kept in the erect posture with the head in the midline. Otherwise, most peculiar observations will be obtained and errors in diagnosis will be made. I believe that the air which is subarachnoid at the time of the introduction goes into the subdural space whereon the convolution markings are lost; therefore, I feel that the sooner the roentgenograms are made, the better the result will be.

COMMENTS

Dandy deserves a great deal of credit for the work that he did in introducing the diagnostic methods of ventriculography and encephalography. Ever since they were first described, the author of these procedures has been criticized by some and praised by others. The procedures are becoming more popular and even those who criticize Dandy utilize these methods as an aid in diagnosis.

There are others who decry encephalography, believing that ventriculography is the procedure of choice, and vice versa. It seems to me that the indications and contraindications for the two procedures are precise and the two are essential if the maximum information for diagnosis is to be obtained. I cannot agree with Grant [12] when he states that "encephalography is a more shocking and distressing procedure for the patient than ventriculography." The fact that he [13] states that "any neurologist who can perform a lumbar puncture and who owns a syringe can carry it out" argues against the foregoing conclusion. There is little mortality associated with encephalography. In an analysis of 1,529 cases, Pancoast and Fay [8] report twenty deaths, or a mortality of 1.2 per cent, whereas Grant [6] found a mortality of thirty-two cases, or 8.1 per cent, in an analysis of 392 cases following ventriculography. In a recent communication, Grant [7] states that, if the patient was operated on within twelve hours after ventriculography, the mortality was as low as in cases in which ventriculography was not done. Another objection that Grant [13] offered against encephalography was that nothing could be done after a diagnosis had been made in the large majority of instances. It seems to me that a large group of patients are continually receiving benefit from the diagnoses made following encephalography. For years, insurance companies have been troubled with a large group of cases termed post-traumatic injuries. Fay [14] in an extensive study of these patients, has found sufficient pathologic changes to account for their symptoms, and it is to be hoped that ample provision will be made for their compensation in the future. At least it is now definitely known that these patients are not malingerers. In a number of other cases, tumors, arachnoiditis, porencephaly, brain abscess, brain atrophy and thrombosis have been diagnosed. Some of these patients have been operated on and permanently benefited.

The roentgenographic technic of encephalography is much more simple than ventriculography because the patient is more cooperative. Furthermore, I examine more patients referred from the neurosurgical division in the University Hospital for encephalography than for ventriculography, and some of these patients have increased intracranial pressure. I have assumed, therefore, that the depressing headache is not a real contraindication and that encephalography is gaining popularity and usefulness.

Considerable disagreement seems to exist among various authors as to the safe limits of intracranial pressure of patients on whom encephalography is planned. Pancoast and Fay state that 20 mm. of mercury in the horizontal posture is a safe limit. Grant [12] states that from 8 to 10 mm. of mercury or from 150 to 200 mm. of water in the horizontal posture is the maximum. Gardner [15] states that he has performed the procedure with safety in the horizontal posture with a pressure of 62 mm. of mercury or 815 mm. of water. He is doing the procedure as a routine in all cases except in those in which a lesion of the posterior fossa is present.

When there is increased pressure, Fay dehydrates the patient for a few days before the operation until the intracranial pressure is approximately normal; then he performs encephalography. Gardner slowly withdraws enough fluid in the horizontal posture to allow the pressure to drop to within normal limits; then the patient is placed in the erect posture and the procedure is completed.

Grant [13] raises another objection to encephalography when he states that the shadows of the air in the subarachnoid spaces are at best indistinct and susceptible of any interpretation to suit the needs of the situation. In this connection, it is believed that the close cooperation of the neurosurgeon and the roentgenologist will obviate this difficulty. The roentgenologist must become familiar with brain anatomy and be able to discuss intelligently roentgenologic observations with the neurologist and the neurosurgeon. Neurosurgeons should not attempt to make their own roentgenologic diagnosis, for herein lies the danger of interpreting clinical observations into the roentgenograms. If the neurosurgeon could recognize that the best diagnosis could be made only after a careful correlation of the clinical and roentgenologic data after consultation, then both the neurosurgeon and the roentgenologist would profit by whatever conclusions were reached.

The advantages of ventriculography are:

1. The ventricular system is completely outlined.
2. Brain lesions, such as tumors, brain abscesses and ventricular blocks from any causes, are localized.

The disadvantages of ventriculography are:

1. Two incisions and two trephine openings are required and the brain is punctured twice.
2. Hemorrhage may occur following the piercing of an unsuspected occipital lobe tumor. Experienced

12. Grant, F. C.: Ventriculography and Encephalography, Progr. Med. **1**: 48-53 (March) 1930.
13. Grant, F. C.: Ventriculography and Encephalography, Progr. Med., March, 1927, pp. 42-44.
14.—Fay, T. S.: Some Factors in the Mechanical Theory of Epilepsy, with Especial Reference to the Influence of Fluid and Its Control in the Treatment of Certain Cases, Am. J. Psychiat. **8**: 783-785 (March) 1929; The Therapeutic Effect of Dehydration on Epileptic Patients, Arch. Neurol. & Psychiat. **23**: 920-945 (May) 1930.
15. Gardner, W. J.: Personal communication to the author.

neurosurgeons, however, can detect the difference between normal brain and tumor tissue, and, should a tumor or hemorrhage be encountered, one could proceed with the operation.

3. Reactions may follow the introduction of the air. Grant states that this can be obviated by proceeding with the operation if the tumor is localized by the ventriculogram. If the tumor is not localized, repeated ventricular tapping with removal of the air will relieve any increase in the intracranial pressure.

4. Mortality is associated with the procedure.

5. There may be failure to find and drain both ventricles.

6. The subarachnoid spaces may not be delineated.

The advantages of encephalography are:

1. The procedure is simple. It can be used in adults, children and infants.

2. There is little mortality.

3. Subarachnoid pathways and the ventricular system are visible. One can visualize the brain as a whole.

4. One can demonstrate lesions on the surface, such as arachnoiditis and brain atrophy, which cannot be demonstrated by ventriculography.

5. Brain tumors, brain abscesses and degenerative lesions with or without slightly increased intracranial pressure can be diagnosed and localized.

6. The lesions in patients with epilepsy receiving treatment can be followed.

7. Post-traumatic headache is relieved.

The disadvantages of encephalography are:

1. It causes severe headache, some nausea and possibly vomiting.

2. It cannot be used in posterior fossa tumors because of the danger of causing a foraminal hernia.

3. The posterior and inferior horns of the ventricles are not easily drained. If it is desirable to outline these portions of the ventricle, it will be necessary to examine the patient in the postures utilized in making ventriculograms.

The two procedures are sometimes necessary on the same patient, especially in differentiating between an infratentorial and a supratentorial lesion. The neurosurgeon makes a totally different approach on these lesions and an exact diagnosis is essential.

CONCLUSIONS

1. Encephalography and ventriculography are valuable procedures in the diagnosis of brain lesions.

2. The two procedures may be indicated in the same patient to differentiate between an infratentorial and a supratentorial tumor.

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ABSTRACT OF DISCUSSION

DR. B. R. KIRKLIN, Rochester, Minn.: I think it is only fair to Dr. Pendergrass and his associates who have done pioneer work in this field during the past two years that some one at least express appreciation for the splendid work that they have done. I should like to take this opportunity of doing so.

DR. M. D. JACOBY, Detroit: As to the indication for the use of encephalography: in the cases of brain injury at birth, with resulting destruction of a large amount of cerebral structure, cases in which the parents go from physician to physician and spend all their good money in the hope of a cure, in most instances encephalograms will show definitely to the parents the amount of destruction of brain tissue and the uselessness for further striving.

DR. G. ALEXANDER YOUNG, Omaha: From the neurologic standpoint, a physician is frequently confronted with patients giving a history of vertigo and headache and a more or less pronounced deterioration of the individual's capacity for work. As every physician knows such cases are bitterly fought by the insurance companies and oftentimes justice is not rendered to the patient. As an instance, I might cite a case I recently saw in which a man had received serious injuries from an automobile accident, had been comatose for about ten days, and from that time on, besides his complaint of headache and vertigo, had been wholly unable to carry out his work as a traveling salesman. However, because of the splendid appearance of the man and because he was able superficially to give an impression of normal mental health, no definite verdict had been rendered. Psychiatric examination showed that the man had a serious dementia. The case came before the district court after going through the labor commissioner's hands, and finally the patient was referred to me for examination. An encephalogram was advised. This was done and showed a marked dilatation of both lateral ventricles, the lateral ventricles being at least four times their normal size, and a marked cortical atrophy of the left frontal lobe. The objective presentation of definite organic lesions in this case was so striking that as soon as these plates were shown to the district judge a verdict was rendered, giving the man compensation for total and permanent disability. This is an unusual case, but I believe the procedure has a definite field of usefulness in those cases in which there is considerable question as to whether or not organic injury has been inflicted on the patient.

DR. EUGENE P. PENDERGRASS, Philadelphia: I have outlined birth injuries as an important indication for encephalography in my paper and also discussed the question that was raised by Dr. Young—the legal aspect. Insurance companies and compensation boards are utilizing it frequently.

THE PATHOLOGY OF ENDOCARDITIS

A SUMMARY REVIEW *

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CLEVELAND

If the broad definition of inflammation proposed by Marchand, with the adherence of many other pathologists, is accepted, it may be said that except for congenital anomalies, retrogressive changes such as amyloid, and tumors, the lesions of the human endocardium all have certain features that may be regarded at least in part as inflammatory.

ENDOCARDIAL SCLEROSIS

Valve leaflets, especially aortic and to a lesser degree mitral, as well as the mural endocardium, particularly that of the septum near the aortic orifice, frequently exhibit fibrous thickening, atheroma and calcification which justify the conclusion that the lesion is essentially the same as intimal arteriosclerosis. Indeed, the association of such endocardial sclerosis with sclerosis of the aorta is almost constant. In the aortic leaflets the fibrosis is especially prominent at the attached bases of the valves and is still most conspicuous in this situation after the entire leaflet becomes notably thickened and stiff. Atheroma is not a common feature in this valve but calcification is frequent and may proceed to the formation of hard stony knobs in the substance of leaflets and sinuses of Valsalva. Fibrous adhesion between

* From the Institute of Pathology, Western Reserve University School of Medicine.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the author's reprints.

* Read before the Section on Pathology and Physiology at the Eighty-First Annual Session of the American Medical Association, Detroit, June 25, 1930.

leaflets at the commissures may extend for several millimeters but rarely exceeds 1 or 2 mm. The valve edges are not often rolled, and retraction is not marked. Thus interference with valve function depends principally on the stiffness of the leaflets and the deformity of extensive calcification. The correlation of anatomic and clinical observations leads to the conclusion that even although murmurs may be loud and thrills palpable, cardiac embarrassment is not great. In the mitral area the lesion may be of the same nature but much less severe. The usual sclerotic lesion of the mitral valve is a yellow plaque in the middle of the body of the larger leaflet. This apparently represents a minor degree of atheroma in an area of fibrosis. The condition is without significant alteration of function. Occasionally sclerosis of the mitral valve may be severe with calcification in the leaflets and the valve ring, but usually such calcification is found in connection with a genuine chronic endocarditis. The leaflets in infancy and early childhood may show pink plaques in the center which are lakelike collections of blood vessels. They probably disappear without residua and there is no

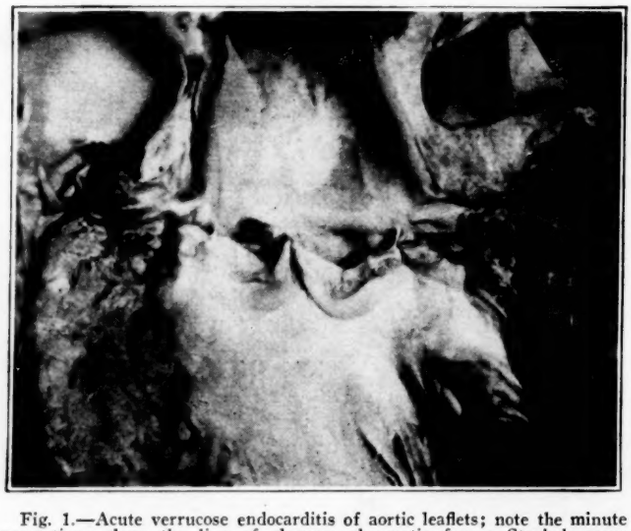

Fig. 1.—Acute verrucose endocarditis of aortic leaflets; note the minute vegetations along the line of closure; rheumatic fever; Staphylococcus aureus in the blood culture.

clearly established connection between them and similarly disposed plaques of opacity observed in later life. It is often impossible to distinguish sharply between these opaque areas which are regarded as normal and areas of early sclerosis. It is difficult to assume that sclerosis of the mural endocardium is of any real importance. That sclerosis of the arteries or endocardium depends on infectious disease may be true but certainly has not been proved. The same prevails in regard to any other proposed cause of such sclerosis. Nevertheless, this condition is progressive and shows a continuous production of connective tissue. It is not a scar. Sclerosis may in the earlier stages show fibrin. The connective tissue growth is continuous and progressive. These facts justify the opinion that it has an inflammatory component chronic in nature even although bacteria and their products are not proved to be concerned.

ENDOCARDIAL SYPHILIS

Late syphilis of the endocardium is chiefly of importance because of involvement of the aortic ring and the aortic leaflets. There can be no question that the lesion of the ring substance, which permits dilatation, is of the same inflammatory nature as that of the aortic media. The extension of aortic disease to the leaflets so that the commissures are widened by fibrous adhesion of the leaflet margins to the walls of the sinuses of Valsalva has been shown clearly by Saphir[1] to be inflammatory in nature. Except for endocardial pockets, not distinctively syphilitic in themselves, in the septal wall below insufficient aortic valves, this fibrous type of syphilis is of no genuine importance elsewhere in the endocardium. Clinical and anatomic correlation show that while the lesions of syphilis are often less conspicuous than those of simple sclerosis, they lead to much greater interference with cardiac function. This is probably because a slight or moderate stenosis, such as occurs in simple sclerosis, interposes less interference with adequate circulation than does the slight, moderate or severe insufficiency of a syphilitic lesion of the aortic orifice.

ENDOCARDITIS

The term endocarditis is not applied to the conditions just discussed. It is restricted to those lesions of the endocardium which in their course exhibit exudation and its sequences. They are all related to and are a part of general infectious diseases. Many show the actual invasion of bacteria into the diseased endocardium. The rheumatic group is probably related to the presence of the virus in the endocardial lesion. There are, however, a few instances in which the lesion appears to be independent of direct bacterial infection, the so-called toxic endocarditis. This is the mild acute verrucose endocarditis which occasionally is observed in patients who die of tuberculosis, chronic nephritis, hepatic cirrhosis, malignant tumors and wasting diseases generally. These minute, firm, gray or yellowish gray, adherent nodules are situated along the line of closure of the mitral leaflets and occasionally also in a similar situation on the aortic leaflets. They appear to represent a terminal event and there is no reason for assuming that they occur early in the course of tuberculosis and lead to subsequent permanent deformity. As a rule, such a variety of endocarditis is an incidental finding at autopsy and not demonstrable clinically. It is rare to find bacteria in these lesions, whether the disease is associated with tuberculosis or with any other disease. This has led to the assumption that the products of the general disease or the products of the bacteria which cause it produce the endocarditis.

Classification.—Most significant are those varieties of endocarditis associated with infectious diseases in which the lesions contain bacteria or appear to be due to the direct action of a presumptive virus of an infectious disease. If bacteria are present in the lesion they are not necessarily the cause of the general disease but may be secondary invaders. The etiology of endocarditis will be discussed after the morphology of the lesions have been presented. Simple acute verrucose endocarditis is typified by that seen in rheumatic fever and may or may not exhibit bacteria. Mycotic endocarditis almost always exhibits bacteria. Anatomically, the lesions vary from multiple nodules with a diameter of several millimeters, one or a very few large nodules with a diameter of a centimeter or more, both forms being grouped as acute vegetative endocarditis, to lesions in which necrosis of the vegetation may produce the erosions of ulcerative endocarditis, sometimes with penetration through the leaflets. Some authors employ the term malignant endocarditis to this entire group,

1. Saphir, O., and Scott, R. W.: The Involvement of the Aortic Valve in Syphilitic Aortitis, Am. J. Path. **3**: 527 (Sept.) 1927.

whereas others limit this term to the ulcerative type. The implantation of acute lesions on a chronic endocarditis is often referred to as recurrent endocarditis. Finally there is the subacute bacterial endocarditis, so well studied in this country by Libman [2] and his collaborators. Bacteria are found readily in the lesions if the patient dies in a bacterial cycle of his disease. It is not to be thought that all these varieties are sharply distinguishable in each and every case, but as a rule the classification of particular lesions can be established.

Fig. 2.—Acute vegetative endocarditis of the aortic leaflets; extension over the ventricular surfaces of two leaflets; no cultures.

It will be noted that this classification is based largely on morphologic alterations of the endocardium. Other classifications depend on the associated general disease, the bacteria isolated from the blood or lesion and the correlation of clinical, pathologic and bacteriologic observations. These are all of value, but the morphologic alterations can be grouped in the categories previously indicated.

Acute Endocarditis.—The morphology of this disease shows an association of thrombotic masses on the endocardium associated with lesions in and under the endocardial surface. The study of experimental and human material shows nodular lesions in the endocardium which, when they do not extend to and involve the surface, do not show associated thrombosis. They may be large enough to produce verrucae on the surface, but without other alterations of the surface they do not show thrombi. It is therefore assumed that the surface thrombi are in large part, if not always, secondary to a disturbance of the endocardium below its surface. In the following discussions it must therefore be considered that the endocardial and subendocardial reactions described may occur independently of the thrombi.

Acute Verrucose Endocarditis.—This is most frequent in rheumatic fever but is observed also in septicemias and in the so-called toxic lesions already discussed. Characteristically there are minute, pale yellow, soft, semiglobular, sessile, loosely adherent, sometimes superficially lobulated nodules less than a millimeter in diameter, beaded along the line of closure of the leaflets. They may increase in number near the corpora Arantii of the semilunar leaflets, or toward the middle of the line of closure of the atrioventricular leaflets. This increase in number is shown in lateral spread along the leaflets rather than in a heaping up to form large projecting masses. I have never observed the spread of such lesions from the semilunar valves, and only rarely do they extend from the atrioventricular leaflets to the chordae tendineae or mural endocardium. Microscopically the warty nodules are made up largely of fibrin in heavy, often hyalinized, masses and in fine network. Enmeshed are blood cells in small numbers. Only rarely are bacteria found. The endothelium has disappeared under this lesion. The reaction in the substance of the leaflet is not severe. Existing blood vessels may be dilated and new capillaries may be found. Vascular thrombosis is uncommon. Fibroblasts appear and large mononuclear cells, lymphocytes and rarely plasma cells are found. Polymorphonuclear leukocytes are not common except in gonococcal lesions. In the rheumatic cases the large mononuclear cells may show the scalloped outline nucleoli of the so-called Aschoff cells. Early the lesion is external to the elastica but may extend more deeply into the leaflet. It is presumed that such a lesion may heal, but in rheumatic fever it is likely to result in a progressive chronic inflammation of the leaflet, extending widely and leading to adhesions and distortion. Probably this chronic inflammation exhibits exacerbations as subsequent cycles of the primary disease are manifested.

Mycotic Endocarditis—Vegetative and Ulcerative.—The situation of the larger thrombi of acute vegetative endocarditis varies more widely than that of the acute verrucose form. Smaller masses may be found along the line of closure. Larger masses may be found near the middle of the substance of the leaflet or may appear to spread laterally on the leaflets from a point of origin at or near a commissure. Such lesions occur on otherwise normal or on previously diseased leaflets. The vegetations, if multiple, may attain a diameter of 5 or 6 mm., or if single may attain a diameter of 1 or 2 cm. In the latter instance there are likely to be several small vegetations 1 or 2 mm. in size closely associated. Usually sessile and firmly attached, they may occasionally be pedunculated. The color may be some shade of yellow, or mottled red and yellow, but is usually dark red or mottled light and dark red. The nodules are fairly firm but friable and the outer surface is finely or coarsely lobulated. If superficial necrosis has

Fig. 3.—Acute ulcerative endocarditis of the aortic leaflet. The ulcer perforates the leaflet into the sinus of Valsalva. Pneumococcus in blood culture.

2. Libman, Emanuel: Characterization of Various Forms of Endocarditis, J. A. M. A. **80**: 813 (March 24) 1923.

occurred, the resulting ulcer has a shaggy friable base on which a fresh currant jelly clot may adhere. If an ulceration penetrates into the valve substance, a leaflet aneurysm may result. If the ulceration perforates the leaflet, small dark red or yellow vegetations appear around the perforation on the opposite side of the leaflet. In the case of semilunar leaflets, these vegetations may be massive in the sinuses of Valsalva. In the case of atrioventricular leaflets the vegetations may extend to the chordae tendineae and to the mural endocardium. Without ulceration, extension of acute vegetative endocarditis beyond the limits of the leaflets may occur and in either instance the process may invade the myocardium to produce abscesses.

Microscopically the thrombus shows fibrin masses and mesh, much as in the verrucose form. More red blood cells and blood pigment give the darker color of this nodule as compared with verrucose forms. Polymorphonuclear leukocytes are abundant, as are also clumps of bacteria. Even without ulceration, foci of necrosis are common within the exudate. The substance of the leaflet shows vascular reactions, mononuclear cell infiltrations, edema and polymorphonuclear leukocytes as in acute exudative inflammation, at first external to the elastic lamina and later penetrating more deeply. In the event of ulceration of the leaflet, necrosis is observed and polymorphonuclear leukocytes increase in number. Thrombosis of the vessels of the leaflet is much more common here than in the verrucose form. Fibrin strands may be found in the leaflet in continuity with the fibrin of the vegetation.

Fig. 4.—Subacute bacterial endocarditis of aortic leaflets. The organizing vegetations are attached only to the leaflets and not to the ventricular wall or mitral leaflet. Streptococcus viridans in the blood culture.

Recurrent Endocarditis.—This exhibits fresh verrucose or vegetative endocarditis implanted on an endocardium the seat of chronic endocarditis. This may occur in septicemias of patients already the victims of chronic endocarditis or may be seen in rheumatic fever patients. Its various forms approach that of subacute bacterial endocarditis and are easily confused both anatomically and clinically.

Subacute Bacterial Endocarditis.—In its type form, this disease is characteristic. It is not literally subacute but represents a more or less continuous formation of acute or subacute verrucose and vegetative endocarditis in close association with progressive chronic endocarditis and granulation, and the term endocarditis lenta, proposed long ago by Schottmüller, is more descriptive of the lesions observed. The degree of chronic alteration of leaflets, chordae tendineae and contiguous endocardium is variable from slight changes to severe deformity. The acute process is not ordinarily in the form of large vegetations, nor is it always free from large masses. Usually the vegetations are a few millimeters in diameter, but whether small or large the masses are relatively firm, only moderately friable and commonly yellow rather than red or mottled. Pedunculated vegetations are rare. The vegetations do not appear directly on the leaflets for there is usually an intervening mass of soft tissue, firmer toward the leaflet and softer toward the vegetation, usually endothelialized well up to the vegetation. Postmortem blood cultures are positive if the death is in a bacterial cycle of the disease. Organisms are not infrequently obtained from the vegetative process. Microscopically the thrombus is like that seen in the verrucose endocarditis except that the number of leukocytes may be greater, and small clumps of bacteria are often found. Immediately adjacent there is more or less fresh granulation tissue often not extremely well vascularized. This merges through older granulation to the chronically diseased valve leaflet. Owing to the fact that this disease is often implanted on previous rheumatic disease, the leaflet may show cellular accumulations like those of rheumatic fever.

A special feature of subacute bacterial endocarditis is the fact that the process often extends beyond the limits of the leaflets. In the atrioventricular area, extension to the chordae tendineae and even to the ventricular endocardium occurs. Extension to the atrial endocardium may also be observed. The lesions of the aortic leaflets often extend to the ventricular surface of the mitral and sometimes to the ventricular endocardium. Extension to the aorta is uncommon.

Although the course of the disease and the gross anatomic appearance are often characteristic, it is by no means established that this is a disease *sui generis*. The bacteria concerned are usually *Streptococcus viridans*, but in some of the German studies *Streptococcus hemolyticus* has been found to predominate. *Bacillus influenzea* and other organisms are occasionally found. Thus, there is no established etiologic unity. The work of Bell and Clawson [3] indicates that the course and the nature of the disease are determined by factors of virulence and resistance and that its morphologic manifestations differ only in degree and not in essential features from other forms of endocarditis.

Chronic Endocarditis.—The term chronic endocarditis is restricted to a continuous disease of the endocardium on the basis of acute endocarditis, clearly distinguished from nonsyphilitic sclerosis and the alterations incident to syphilis. It manifests itself in thickening, retraction and adhesions of the affected structures. The fibrous thickening of leaflets is usually more marked at or near the free edge than elsewhere, but in advanced lesions this feature is not prominent and may be absent. The leaflets lose their pliability and may be quite rigid. In the atrioventricular areas the atrial surface of the leaflets often shows a clearly visible subendocardial vascularity above that which may be considered normal. Retraction or shortening of the leaflets is usually evident but not severe.

In the semilunar leaflets the shortening may be accentuated by a curling of the free edge toward the

3. Bell, E. T., and Clawson, B. J.: A Comparison of Acute Rheumatic and Subacute Bacterial Endocarditis, Arch. Int. Med. **37**: 66 (Jan.) 1926.

sinuses of Valsalva, in contrast to the curling toward the ventricle seen in syphilis. Adhesions between the leaflets are dense, fibrous and likely to be extensive. In the mitral area and even in the tricuspid area, the valve commissures may be completely obliterated with the formation of the so-called funnel and buttonhole valves. The position of the commissures of the semilunar valves can be identified, but the leaflets are firmly fused together for a distance of several millimeters, in contrast to the fusion of leaflet margins to the walls of the sinuses of Valsalva and the widening of the commissures in syphilis. In the atrioventricular areas, thickening, adhesion and retraction involve the chordae tendineae. Extension of the general process to the mural endocardium is variable. In connection with semilunar valve lesions, the adjacent ventricular mural endocardium is often thick, dense and opaque; this change probable represents extension. In aortic valve disease, especially with insufficiency, this thickened mural endocardium may show small semilunar pockets, a few millimeters across, variable in number, usually but not constantly opening toward the aorta. This is probably due to mechanical factors of stress operating not only to produce a progressive fibrosis but also to produce the small invaginations. Often referred to as a manifestation of so-called functional adaptation, it is unlikely that they are of physiologic significance. The left atrial endocardium in adults is usually more thick and opaque than that elsewhere. In chronic mitral disease this is more striking and is also to be observed in the right atrium in tricuspid disease. If the mitral disease is rheumatic, the left posterior inferior portion of the atrial endocardium usually shows a wrinkled surface in more or less parallel vertical convolutions. This may involve other parts of the atrium with more irregularly disposed convolution of the surface. There is little doubt that the mural involvement in rheumatic endocarditis is incidental to the disease rather than to an extension from the leaflets.

Microscopically the diseased leaflet shows an intact endothelial surface. The elastic lamina may be intact or ruptured and split. There is a large accumulation of dense mature fibrous connective tissue with moderate vascularization. Usually lymphoid cells are numerous and in the rheumatic cases the mononuclear cells, while not so numerous as in the more acute forms, show a similar degree of polymorphism. The vascularity, cellular infiltration and clinically progressive character of the endocardial lesion are sufficient to justify its inclusion in the category of inflammation rather than cicatrization.

Secondary changes are common in chronic endocarditis. It is well known that such an endocardium shows an increased susceptibility to acute endocarditis. Although hyalinization of the connective tissue is common, fatty degeneration and atheroma are by no means frequently demonstrated. That fatty change occurs may be assumed, but not clearly established, by the occurrence of calcification. In the semilunars, particularly the aortic, calcareous nodules are observed at the bases of the leaflets, at the commissures and sometimes about the valve ring. In the atrioventricular valves, especially the mitral, a ring of calcification is not rare, but toward the bases of the leaflets calcareous nodules are common, especially in the position of the more or less obliterated commissures. Calcareous masses may increase in size and impinge on the endothelial surface. Erosion may then occur, especially on the atrial surface of atrioventricular valves and the ventricular surface of the semilunar valves, whereupon a vegetative thrombosis ensues.

ETIOLOGY

General.—The etiology of endocarditis has its general and special phases. New-born infants have rarely shown lesions of the valves of the left side. Although difficult to distinguish from congenital anomalies, these have been interpreted as healed endocarditis, the acute stage having occurred in utero as the result of the transfer of bacteria from the maternal blood by way of the placenta to that of the fetus. The infections of the mother reported were influenza and acute bronchitis, respectively, six weeks and two months before birth. Endocarditis is not frequent in infancy and early childhood but increases in incidence in the second and third decades. In somewhat later life the effects of chronic endocarditis are observed and much of the acute endocarditis of this period is implanted on chronic lesions. The old rheumatic lesions frequently produce death near the end of the fourth and beginning of the fifth decades.

Fig. 5.—Acute verrucose endocarditis superimposed on chronic mitral stenosis. Note minute vegetations along free edge of the larger leaflet and the line of closure of the smaller leaflet. Rheumatic fever; blood culture sterile.

At about this period the incidence of genuine endocarditis is stationary, but syphilitic disease of the aortic leaflets adds to the number of victims of heart disease. Subsequently valves begin to show the effects of sclerosis, and endocarditis is reduced in frequency. Subacute bacterial endocarditis is a disease of late adolescence and early adult life. The sex incidence of endocarditis seems to be indefinite except that mitral stenosis is more frequent in females than in males. Syphilitic aortic disease is largely a disease of males, as is also valvular sclerosis.

Direct.—The direct causes of endocarditis must be discussed from the point of view of general diseases, bacteria and viruses, influence of trauma, participation of leaflet vessels, focal infection and factors of virulence and resistance in association with altered tissue reactivity, the so-called allergy.

BACTERIA

At least 20 per cent of patients with rheumatic fever exhibit endocarditis and 60 per cent of endocarditis is of rheumatic origin. Bacteria may or may not be found in the blood and in the endocardial

lesion. Streptococci, especially the green producing form, and other organisms have been recovered, but it is usually supposed that they are secondary invaders. The evidence in favor of *Streptococcus cardioarthritidis* is not generally regarded as conclusive, and there are probably other factors which operate, even if this organism finally is established as the bacterial cause. Endocarditis is much less frequent in chorea than in rheumatic fever.

Pneumonia, osteomyelitis, septicemias and pyemias resulting from wounds and infections incident to childbirth and the like, typhoid fever, scarlatina, diphtheria, measles, variola, influenza, tuberculosis, gonorrhea and other infectious diseases may be complicated by endocarditis. About 4 per cent of patients with pneumonia develop endocarditis, but in only about half of these instances is the pneumococcus found, other bacteria recovered probably being secondary invaders. The endocarditis that accompanies the other infectious diseases shows the causative organism of the general disease in some instances and what appear to be secondary invaders in others. Gonococcal endocarditis must show the presence of gonococci in the blood or

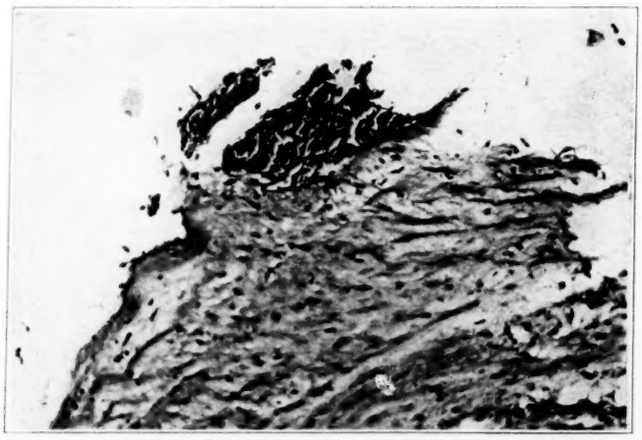

Fig. 6.—Cross-section of vegetation in rheumatic fever, from a photomicrograph with a magnification of 100. Note fibrin mass without bacteria. Blood culture sterile.

lesion to be accepted as such. The endocarditis of epidemic meningitis practically always reveals meningococcus.

TRAUMA

Observations of human hearts, the seat of direct or indirect trauma, have been made shortly after and several years subsequent to trauma. The destruction of endothelium has been followed by thrombosis which heals and cicatrizes. A genuine inflammation, either acute or chronic, does not occur. The production of aseptic injury to the endocardium in experimental animals, in the hands of numerous investigators, has given the same result. If at the time of trauma, or shortly thereafter, pathogenic bacteria are introduced, endocarditis develops with great regularity. A single introduction of bacteria into the blood stream may produce endocarditis in a variable percentage of animals, usually small. Highly successful results ensue only if other conditions are present, such as multiple injections of organisms or other treatment of the animal.

The fact that lesions are frequent along the line of closure suggests that the snapping together of leaflets may be of significance. It is unlikely that traumatic tearing of the normal endothelial lining occurs. In acute infectious diseases the endocardial endothelium shares in the swelling and degeneration that occur in various parts of the body. Such endothelium may then be more susceptible to mechanical injury and may thus provide a focus of entry for organisms in the blood. Attractive as this supposition may seem, histologic study of diseased leaflets indicates that the inflammatory process is primary in the substance of the leaflet and that thrombosis is secondary to extension into the endocardium rather than to primary injury of the surface.

LEAFLET BLOOD VESSELS

With improvement in methods, it has been possible to demonstrate that leaflets are more widely vascularized than was formerly thought. Rosenow's experimental studies show that in his animals bacterial embolism into the vessel leaflets produces endocarditis. The results indicate an occlusion of vessels near the middle of the leaflet rather than along the valve edges. There is no doubt that a similar condition occurs in man, especially in the outspoken septicemias; but it is by no means relatively frequent. The newer information about vascularization makes it possible that bacteria may lodge in minute vessels at or near the line of closure but not in the sense of clumped masses as in Rosenow's experiments. It is probable that in this event factors of virulence, resistance and altered tissue reactivity are of significance in determining the activity and reaction to bacteria so deposited.

ELECTIVE LOCALIZATION

The matter of microbic dissociation is in no state as yet for discussion as to its relation to endocarditis. The hypothesis of selective affinity of strains of bacteria for special tissues is regarded as still unsettled by many, including myself. There seems to be insufficient evidence to accept the assumptions proposed. The argument of Howitt and Van Meter [4] that the deposit of organisms in and about joints is due to poor circulation is equally adaptable to heart valves, whose frequent involvement can be explained on this ground quite as well as on that of organismal selectivity. The predilection of rheumatic lesions for heart valves, vessel walls and periarticular structures harmonizes with this proposition.

RESISTANCE AND VIRULENCE

It is well known that several of the organisms concerned in endocarditis vary considerably in virulence. Equally familiar is the fact that the human body constitutionally and at different periods in life varies in resistance. An organism of low virulence may, in a state of low resistance of the body, excite general phenomena and local inflammations as severe as those induced by an organism of high virulence in a highly resistant body. Both factors are difficult to measure quantitatively, but the hypothesis is well founded. Bell and Clawson emphasize this relation in endocarditis and assume with good reason that local and general manifestations may depend to a large extent on factors of virulence and resistance, especially in the explanation of subacute bacterial endocarditis.

ALLERGY

This discussion leads naturally to the matter of allergy. No exact definition for this term can be given, especially with the newer conceptions of immune reac-

4. Howitt, Beatrice; and Van Meter, Martha: Lesions Produced in Rabbits by Lactobacillus Cultures, J. Infect. Dis. **46**: 368 (May) 1930.

tions; but in the minds of most students it represents an alteration in reactive capacity of the tissues. This alteration is usually thought to be in the direction of increased reaction, but literally decreased reaction must also be included. In syphilis, for example, there are periods of manifestations of the disease in which tissue reaction is noteworthy, alternating with periods of latency in which tissue reaction is absent, perhaps owing to an actual increase in resistance. Both phases may be regarded as allergic, although the resistant phase may be thought of as an evidence of immunity. Recently it has been shown that local hypersensitiveness may exist in a body coincidentally and contemporaneously with general immunity. The strict definition of immune phenomena is now undergoing a change as the result of such observations as that just recorded, various clinical and laboratory studies of the same principles and reports on the Schwartzmann phenomenon, an antigen-antigen reaction contrasting sharply in its presumed nature with the common antigen-antibody reactions. The consideration of allergy in endocarditis must therefore be in less exact terms than would have been regarded as necessary in the older immunology. Furthermore, the ideas of strict specificity in allergic phenomena have had to be relinquished. Swift and his associates [5] have studied the question as it relates to rheumatic fever and the inferences drawn are applicable to the cardiac lesions of this disease. They find in rheumatic fever a variety of types of streptococci. Neither the streptococci nor other material from patients is capable, on a single injection, of inducing lesions in animals like the rheumatic lesions of man. Following previous inoculation the animals become sensitive, so that otherwise harmless doses of streptococci induce lesions which resemble

Fig. 7.—Acute vegetative endocarditis superimposed on chronic mitral stenosis; fresh vegetations at line of closure. The vegetations extending to the atrial wall are covered by endothelium. Staphylococcus aureus septicemia in old rheumatic fever.

somewhat rheumatic manifestations. Applying extensive studies of himself and others, Swift [6] concludes:

> The theory is advanced that the pathogenesis of rheumatic fever can be explained by the existence in certain individuals by a condition of hypersensitiveness (allergy or hyperergy) to streptococci resulting from repeated low-grade infections or the persistence of foci of infection in the body. When under suitable circumstances streptococci or products of streptococci are disseminated in the tissues these tissues overreact and the characteristic picture of the disease results.

The experiments of Clawson [7] and others are in harmony with Swift's theory. It will be noted that nowhere in this hypothesis is the factor of a high degree of specificity of significance. Preceded by other studies of the relation of bacteria to endocarditis, the work of Semsroth and Koch [8] has added materially to our information. Thus, if animals are sensitized with horse

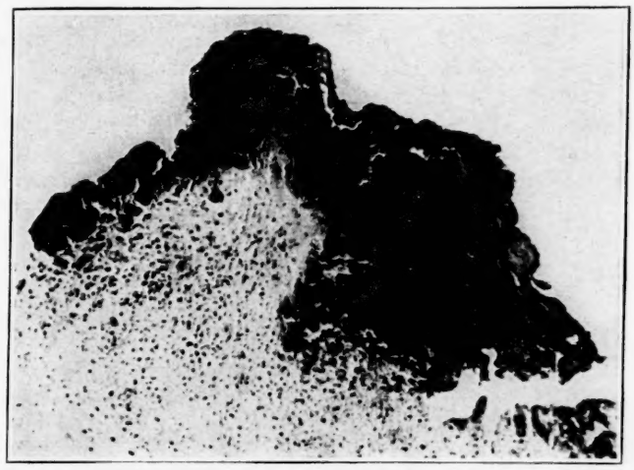

Fig. 8.—Cross-section of vegetation at the line of closure in figure 7, just above cut chordae tendineae; from a photomicrograph with a magnification of 100. The lighter colored masses are fibrin, the darker colored are bacteria.

serum, an endocarditis can be produced by typhoid bacilli and by staphylococci. More satisfactory results were secured in that intravenous injections of killed streptococci or of casein so prepared the animals that staphylococci would produce endocarditis in a high percentage of instances. These studies tend further to remove from the issue the matter of specificity, and to suggest the reason for the wide variety of bacteria found in endocarditis. Ultimate correlation of the newer facts of immunology as a basic study, together with observations on disease, may serve to clarify the situation. At present, it may be said that the theory of altered tissue reactivity is an attractive and apparently sound explanation of the morphologic, bacteriologic and clinical phenomena observed.

2085 Adelbert Road.

5. Swift, H. F.; Derick, C. L., and Hitchcock, C. H.: Rheumatic Fever as a Manifestation of Hypersensitiveness (Allergy or Hyperergy) to Streptococci, Tr. A. Am. Phys. **43**: 192, 1928.

6. Swift, H. F.: Rheumatic Fever: Hektoen Lecture, Billings Foundation, J. A. M. A. **92**: 2071 (June 22) 1929.

7. Clawson, B. J.: Experimental Streptococcic Inflammation in Immune and Hypersensitive Animals, with Special Reference to the Pathogenesis of Rheumatic Lesions, Abstr. Proc. Am. A. Path. & Bacteriol., Am. J. Path., to be published.

8. Semsroth, Kurt; and Koch, Robert: Studies on the Pathogenesis of Bacterial Endocarditis, Arch. Path. **8**: 921 (Dec.) 1929.

Pathology of Chronic Sinusitis.—The theory of the vascular basis of the morbid changes in sinusitis receives therapeutic support in the employment by clinicians of drugs which directly affect the vascular system. It is also true that no tissue in the body is more prone to vascular changes from extrinsic and intrinsic causes than the mucous membrane in the nasal cavities. The physiologic duties which the mucous membrane of the nose subserve have no analogy in any other structure of the body. This is particularly true in relation to the quantity of blood which passes through this region daily, with momentary variation in the quantity as the caliber of the blood vessels changes with every variation in the temperature, humidity or other atmospheric stimuli. Therefore, the slightest tissue alteration that influences the resiliency and contractility of the vessels will produce altered function.—Eggston, A. A.: Pathology of Chronic Sinusitis, *Arch. Otol.*, November, 1930.

THE MANAGEMENT OF FRACTURES INVOLVING THE PARANASAL SINUSES *

JOHN J. SHEA, M.D.
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The management of fractures involving the paranasal sinuses is similar to the surgical procedures followed in radical sinus surgery. In fact, the most common complication of these fractures is sinusitis. The rhinologist is best prepared to handle these fractures, and by obtaining good results he can convince the general surgeon that these cases belong to his specialty. Today an increasing proportion of hospital emergency cases are head injuries, the results of accidents during rapid transportation, industrial injuries and those obtained from bodily violence.

The majority of the fractures of the facial bones exclusive of the simple nasal bone fractures, extend into the maxillary, frontal or ethmoidal sinus. The sinus involved fills with blood, which readily becomes infected.

The basis of treatment is the replacement of the bony fragments, and the drainage of the sinus entered. This will restore the features.

MAXILLARY SINUS

"The superior maxillae are the largest bones of the face, excepting the lower jaw, and form, by their union, the whole of the upper jaw" (Gray). Because of their prominence and size they are the most frequently fractured. Blows received in fighting, falling or being forcibly thrown forward during a collision usually land on the malar prominence, which is easily displaced. The malar bone may be displaced forward, backward, inward or outward, and these displacements can be readily felt on palpation. In any event its articulations are severed. The bone comprising the external and posterior surfaces of the superior maxilla is thinner than that of the malar

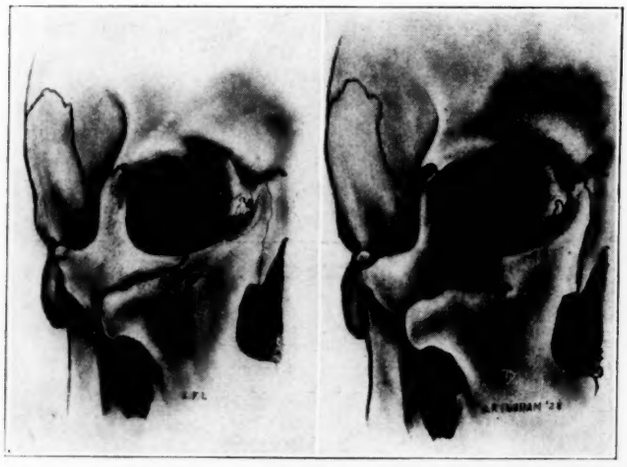

Fig. 1.—Usual displacement of malar bone as the result of a crushing injury.

process, and crushes after the fashion of an egg shell. At times this irregular fracture will start at the inferior margin of the orbit and circle round the base of the malar process, ending at the junction of the posterior wall and the palate bone. This type of injury tears the antral membrane, and its cavity fills with blood.

A roentgenogram of a typical case will present a cloudy antrum on the injured side and an inward or outward rotation of the malar bone, with a change in the transverse diameter of the corresponding orbit.

A study of the normal orbit in the routine postero-anterior sinus film will show a line in the outer third made by the junction of the outer orbital wall and the skull. This line bears a constant relationship to the

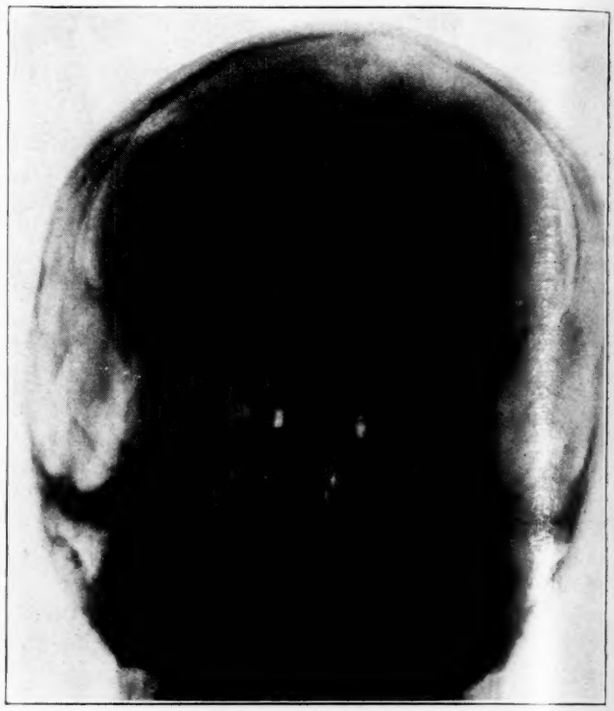

Fig. 2.—*A*, line made by junction of the outer orbital wall and the skull; *B*, rim of orbit.

outer rim of the orbit and may be used to determine whether or not the malar bone has been displaced. The transverse diameter of the orbit is altered in these fractures, being increased in case of outward displacement and decreased in crushing injuries in which the malar is rotated inwardly. This relationship and diameter are controls, available for use in determining the correct position of the parts after the resetting of the fractures.

The malar bone and the firm bone composing the malar process of the superior maxilla are displaced in the direction of the force. The articulations of the malar give way with a resulting separation of it from the frontal, the temporal and the superior maxilla. At times the fracture extends forward into the ethmoidal cells.

Gill [1] has suggested the use of special forceps similar to large towel forceps to reduce malar displacements. The bone is grasped through the skin, and traction is applied with palpation as a guide. If successful, this method is safe and simple and leaves no scar, and the absence of an open wound reduces the possibility of infection. If the antral wall is badly depressed, the force exerted to replace the fragments must be intra-antral. A very simple method is to make a naso-antral window under the inferior turbinate and insert a number 7 Ritter sound. With one hand external for palpation, the sound can be guided in the elevation of the fragments into their places. A rubber tube passed

* Read before the Section on Laryngology, Otology and Rhinology at the Eighty-First Annual Session of the American Medical Association, Detroit, June 26, 1930.

1. Gill, W. D.: Fractures About the Orbit, South. M. J. 21: 527 (July) 1928.

through the window into the antrum will serve as drainage. If the anterior antral wall is badly comminuted, I prefer doing an open operation. The usual buccal approach of the antrum is made and the fragments are studied. Those which can be retained are replaced into their proper position and the others removed. The muscular attachments to the fragments are capable of preventing their free manipulation and at times have to be separated before satisfactory reduction can be obtained. Packing is seldom needed, but drainage should be maintained.

A blow struck with horizontal force against the front of the upper jaw will produce a transverse fracture of the superior maxilla and at times inflict an injury to both maxillae. This fracture presents a characteristic change in the features of the person so injured. The upper teeth drop down on the lower jaw and elongate the features. At times this fracture extends into the nose or mouth.[2] One of my patients suffered such an accident by having his head jammed between the floor of a freight elevator and a half gate. The ramus of the inferior maxilla may sustain a sudden strain, and often snaps, with an added downward displacement of the upper and lower teeth. These cases demand immediate reduction, care being used to obtain a good apposition of the teeth. The lower jaw fracture should be reduced and anchored in position. These fractures are seldom single, and each case is a rule unto itself, but immobilization should be started to a solid base. The skull cap can be encased in plaster, and supports can be anchored into the plaster. From these fixed supports, other supports or appliances should extend to the fractured parts. If there are multiple fractures involving the upper and lower jaws, it is necessary to wire the jaw in position. This is important to assure a free and unlimited movement of the jaw after the fractures have healed.

Fig. 3.—Depressed fracture of antrum.

I saw a man who had a locked jaw due to the neglect of not having the upper teeth; their alveolar processes slid forward into their natural position, and the resulting vicious union locked the lower jaw. When first seen by me, he could separate his gums less than an inch. I had to separate the old fracture and displace the upper teeth forward. Unfortunately in this case the ramus of the jaw on the left side had been fractured at the time of the injury, and being unrecognized had healed in a bad position, leaving him with a limited motion of the lower jaw.

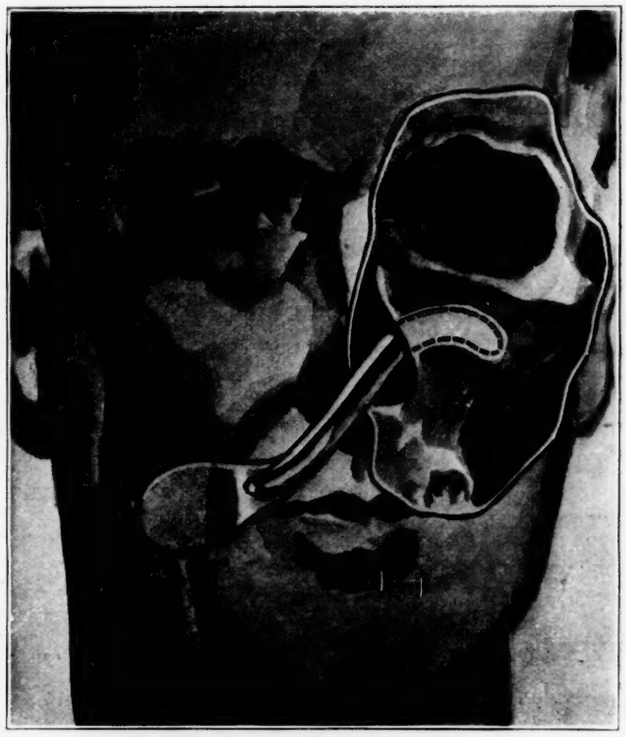

Fig. 4.—Manner of insertion of Ritter sound when elevating antral walls.

The after-care of the open case is the same as after a radical antral operation. The patient should be instructed to report back whenever he contracts a head cold, and the local condition should be treated to avoid a sinus infection. These sinuses have sustained a permanent injury and are more subject to infection than before the accident. Furthermore, the infection readily escapes through into the soft tissues, and adequate drainage should be maintained. If there has been a through and through wound of the cheek, it is best to close tight the mucous membrane and drain the skin wound.

FRONTAL SINUS

Perforating fractures are more common in frontal sinus injuries than in maxillary fractures. It requires force and velocity to penetrate the thick outer wall of the frontal sinus, and fortunately its thin inferior surface is protected. The management of the frontal sinus fractures depends on whether the fracture involves the outer and inner walls or just the outer wall. If the fracture does not include an injury to the inner wall, drainage by the natural route through the nasofrontal duct will suffice. The external wound should be cleansed, and all loose bone removed. It may be closed with minimun drainage. The bony wall is readily palpated and any displacement easily adjusted. It is seldom necessary to enlarge the soft tissue opening to reduce these fractures. The nasal membrane is entitled

2. Naftzger, J. B.: Fractures of the Facial Bones Involving the Nasal Accessory Sinuses, Tr. 34th Annual Meeting Am. Laryng. Rhin. & Otol. Soc., 1928, pp. 383-394.

to the same attention as during an acute frontal sinusitis to secure free drainage of the sinus by way of the frontal duct.

Should the frontal duct prove inadequate, the drainage will back out of the wound. This promptly becomes evident. When the inner or cranial wall is injured, an open inspection with external drainage is preferred by most surgeons. The wound through the outer wall is enlarged, and sufficient membrane is stripped off the inner wall to expose the fracture of the inner table. If the bone is depressed it should be elevated, and should there be an aperture in the inner wall it may be enlarged to expose the dura. External drainage is continued through a rubber tube drain until the discharge has ceased. If the dura is torn, it is mended, and for this some surgeons use "dead dura" or fascia lata. Every effort should be made to prevent the frontal sinus mucous membrane from invaginating into the fracture, as there is great danger that there will remain a potential fissure, through which future infections may penetrate into the cranial cavity.

Fig. 5. — End-result of reduced malar fracture.

ETHMOID CELLS

Perforated wounds, as made by bullets, through the orbit often penetrate into the ethmoid cells. Their management should include thorough cleansing of the external wound and the nasal cavities. The majority of these wounds heal readily with little or no deformity. Occasionally they will be followed by adhesions along the tract of the bullet within the nose, or a small shot may lodge in the ethmoid mass.

SPHENOIDAL SINUS

Fractures involving the sphenoidal sinus are fortunately rare, but their care should be along the same lines of common sense as in ethmoidal fractures.

CONCLUSIONS

1. The rhinologist is best prepared to treat fractures involving the paranasal sinuses.
2. The reduction of the fractures and the protection of the sinuses are the underlying therapeutic principles.

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ABSTRACT OF DISCUSSION

DR. CLAIRE L. STRAITH, Detroit: I am sure that all agree with Dr. Shea regarding the treatment of fractures involving the frontal sinus. I shall confine my remarks to the treatment of fractures of the malar bone and upper jaw. Dr. Shea illustrated his method of elevating fractures of the malar bone by applying pressure to its surface by means of a trocar passed through the naso-antral wall. In my hands the large towel clip applied from without has usually been sufficient, but I am sure the two methods could often be combined to great advantage. A more lateral blow sometimes produces a fracture or separation at the point of contact with the temporal bone which gives rise to some unusual symptoms. In one case this immediately resulted in a partial false ankylosis. The man was unable to open his mouth more than a quarter-inch. The mechanical difficulty can be understood by examining a skull. A depression of the posterior wing of the malar bone will force the structures in this area downward till they impinge on the

Fig. 6.—Typical longitudinal fracture of the superior maxilla.

coronoid process of the lower jaw, thereby preventing its forward movement. I wish to suggest a simple treatment which will quickly replace the depressed fragments. Under local anesthesia a small incision is made within the mouth and beneath the posterior wing of the malar bone; a curved trocar, hemostat or similar instrument is then introduced and the depressed portion of the bone raised into proper position. This will immediately relieve the ankylosis and correct the deformity. Dr. Shea called attention to the increasing number of fractured jaws due to the present speed of travel by automobile. Transverse fracture of the upper jaw from a horizontal blow from the front

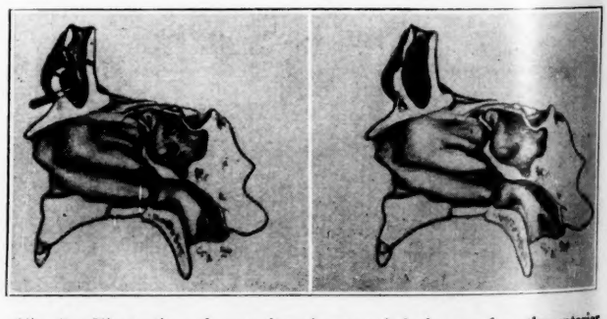

Fig. 7.—Illustration of necessity of external drainage when the anterior and posterior walls of the frontal sinus have been fractured.

is becoming so common that I usually designate the deformity as a "steering post" injury. The sudden stop causes the driver's face to hit the steering post, usually resulting in a transverse fracture of the upper jaw and often multiple fractures of the lower jaw. I am not convinced that the rhinologist should take complete charge of such jaw cases as Dr. Shea suggests, for proper treatment often requires an intimate knowledge of the teeth, their occlusion and splint construction, which the rhinologist seldom possesses, and I therefore feel that he should have an oral surgeon in attendance, or at least some dentist to advise with him regarding the dental aspects of the case.

DR. J. B. NAFTZGER, Sioux City, Iowa: The maxillary antrum, being more exposed to external injury and having a fragile anterior wall, is the most frequent sinus injured and leaves the greatest apparent deformity following if the fracture is not properly reduced. It is not practical in badly comminuted fractures of the antrum to irrigate through the nose to remove the blood that accumulates in the antrum following the fracture, as the solution may be forced into the soft tissues. A naso-antral opening under the inferior turbinate should always be made where the roentgenogram shows a badly blurred antrum. An external opening, as in a radical antrum operation, is a great aid in replacing shattered fragments of wall of the antrum and reducing a fracture of the malar bone. This opening is easily made, as the wall as a rule is comminuted; the opening should be closed at once and drainage established through the nose. I have seldom found it necessary to remove the fragments of bone, as the blood supply is so abundant that if there is any attachment of the fragments they will readily unite and, as Dr. Shea has mentioned, when the fragments are replaced they have a tendency to stay in place without packing or splints. The mucosa should be carefully preserved and the wound through the soft tissues closed. In experiments on the cadaver I found that where the force producing the fracture was applied to the anterior part of the superior maxilla, i. e., just below the nose, the horizontal fracture produced opened the floor of the maxillary sinuses; also that a crushing force applied to the bridge of the nose produced a fracture through the ethmoid labyrinth and sphenoid as well as a possible fracture through the cribriform plate. Fractures of the facial bones should be reduced early, as quite firm union takes place within two weeks or less. I am in accord with Dr. Shea's ideas of the treatment of fractures of the sinuses and endorse his suggestion that the rhinologist should take more interest in this type of injury. The pathology of these fractures should be carefully studied and practical surgical procedures can then be directed toward restoring the form and function of the sinuses. It should not be forgotten that from a business and economic point of view it is important to obtain good cosmetic as well as functional results.

DR. WILLIAM D. GILL, San Antonio, Texas: Fractures involving the facial bones and especially the malar bones are frequently not suspected until after the swelling subsides. Dr. Shea has pointed out a roentgenographic sign that should make the diagnosis of such fractures considerably easier. In order to obtain the best cosmetic result, early reduction of fractures of the facial bones is essential. A variety of methods may be used. I employ special seizing forceps modeled after an ordinary towel clip but considerably heavier. The points pierce the skin, and the fragments are grasped and pulled back into position. When the small puncture wounds in the skin heal there is no apparent scar. The serrated edges of the fragments usually interlock and serve for fixation. If the heavy seizing forceps are not available, a large towel clip serves. Under nitrous oxide-oxygen or procaine, reduction is usually accomplished quickly. Complications of importance in fractures involving the paranasal sinuses are: hemorrhage and emphysema of the face and orbital tissues; injuries to the skull and its contents, or infection of these structures; visual impairment due to pressure of fragments on the optic nerve, laceration of the optic nerve, or compression of the optic nerve by hemorrhagic exudate; osteitis of the bones of the skull, and brain abscess. Fractures involving the alveolar process of the superior maxilla call for cooperation with a dental surgeon who is thoroughly competent in making dental appliances for fixation of such fragments. The best type of fixation device where the support of the facial bones is required is the plaster-of-paris skull cap in conjunction with an interdental splint. I have not found that web caps or leather straps are of any great value as fixation devices. The fixation devices employed for immobilization should be anchored to the plaster-of-paris skull cap. Wiring will occasionally have to be resorted to in order to secure adequate fixation in fractures of the facial bones.

DR. JOHN J. SHEA, Memphis, Tenn.: These cases all came from Dr. Campbell's orthopedic hospital. I do just the fracture face work; the oral surgeon does the fractures of the jaw. The lower jaw cannot be in place, so an attempt is made to anchor it to the upper jaw.

LYMPHOMA MALIGNUM (HODGKIN'S DISEASE) AND LYMPHOSARCOMA

PATHOGENESIS, RADIOTHERAPY AND PROGNOSIS *

ISAAC LEVIN, M.D.
NEW YORK

In the course of the last twenty years I have observed at the Cancer Division of the Montefiore Hospital, at the New York City Cancer Institute and in my private practice more than 500 cases of lymphoma malignum (Hodgkin's disease) and lymphosarcoma. The patients were studied clinically for months and years and in the majority of cases the study was accompanied by a complete pathologic analysis of the surgical and the postmortem material.

Through those years of parallel study of lymphoma malignum and lymphosarcoma on the one hand and of all clinical types of carcinoma and sarcoma on the other, I have gained the conviction that lymphoma malignum (Hodgkin's disease) and lymphosarcoma are nearly identical in their clinical manifestations, that they both represent a special type of malignancy and that the peculiarities in the structure and clinical manifestations of lymphoma malignum (Hodgkin's disease) as compared with other types of malignancy depend not so much on the difference in the causation but on the special character of the structure and function of lymphoid tissue.

PATHOGENESIS OF LYMPHOMA MALIGNUM (HODGKIN'S DISEASE) AND LYMPHOSARCOMA

The regional lymph nodes offer the first barrier to any injurious agent that enters the organism. Acute as well as chronic inflammatory diseases are frequently accompanied by a swelling of the lymph nodes nearest to the port of entry of the injurious agent. This swelling disappears as soon as the inflammatory process ceases.

Malignant lymphoma (Hodgkin's disease) also begins as a swelling of one group of lymph nodes. Microscopically there is noted a hyperplasia of all types of cells of a normal lymph node—the large and small lymphoid cells, the reticulum cells, as well as frequently the granulated leukocytes, mainly eosinophils. There is also present a peculiar type of a giant cell (Dorothy Reed cell). Thus, morphologically, the condition resembles rather an inflammatory granuloma than a malignant tumor.

Nevertheless, the clinical course of malignant lymphoma sets it apart from any known parasitic or inflammatory disease. The lymph nodes increase in size rapidly without any relation to any evident inflammatory process and the disease usually terminates fatally. The condition is thus clinically analogous to cancer. Microscopically the main feature of malignant lymphoma is not a degenerative process as in syphilis or tuberculosis but an active proliferation of all types of cells of the lymph nodes.

The early investigators of the disease considered it to be a neoplastic disease. Later, however, several investigators, and particularly Sternberg,[1] maintained that it is a peculiar type of tuberculosis. Since then many other micro-organisms were claimed to be the causative agent, but no convincing proof was adduced

* Read before the Section on Radiology at the Eighty-First Annual Session of the American Medical Association, Detroit, June 26, 1930.

1. Sternberg: Ztschr. f. Heilk. **19**: 21, 1898.

in any instance. None the less, the idea that it is an inflammatory disease persists. The proof of the inflammatory nature of disease is taken to be the morphologic structure of the lymph nodes and the attacks of fever from which the patients suffer.

In my opinion the most plausible explanation of the relation of malignant lymphoma to tuberculosis and other parasitic diseases consists in the fact that the infectious agents produce an inflammatory lymphadenitis which may then act as a precancerous condition and favor the subsequent development of Hodgkin's disease.

Lymphosarcoma, as the term indicates, is conceived to be a sarcoma, a cancer of the lymphoid tissue. Kundrat,[2] who first described the disease, considered it to be a separate clinical entity, distinct from malignant lymphoma.

Lymphosarcoma differs microscopically from malignant lymphoma as it usually shows the proliferation of only one type of the cells of the lymph node—either the reticulum cells or the lymphocytes. Furthermore, in lymphosarcoma the cells break through the capsule of the lymph node and invade the adjoining tissue. This, however, may also take place in lymphoma malignum. Moreover, I observed frequently the pathologic evidence both of Hodgkin's disease and of lymphosarcoma, not only in the same patient but even in different areas of the same tumor. Cases 1 and 2 illustrate such a combination.

CASE 1.—A. W., a woman, aged 53, was admitted to the institute, Aug. 17, 1927, with a swelling on the right side of the neck of four months' duration. On examination there was felt at the right side of the neck, just anterior to the sternomastoid muscle, a firm, movable, enlarged lymph node measuring about 1½ inches in diameter. The right tonsil, although not enlarged, was hard and nodular in consistency. No other adenopathy was noted. The patient received radium therapy with a resulting marked diminution in the size of the lymph node and softening of the tonsil. The improvement continues to date. A biopsy showed the presence of lymphosarcoma as well as Hodgkin's disease in different fields of the same specimen.

Since it is generally admitted that lymphosarcoma is a type of malignant tumor, there does not seem to be any plausible reason to consider Hodgkin's disease an inflammatory disease. It is a well established fact that patients with cancer are frequently suffering from attacks of fever similar to those with Hodgkin's disease; on the other hand, many cases of Hodgkin's disease show no fever. Therefore, the attacks of fever do not constitute a valid reason for the classification of Hodgkin's disease as an inflammatory disease. Neither is the fact that pathologically a Hodgkin's lymph node shows simultaneous proliferation of the different types of cells a barrier to the conception that Hodgkin's disease is a neoplastic disease. Conditions in which the stroma cells surrounding a carcinoma themselves develop into sarcoma cells have been described both in animals and in the human being. There is no reason why a similar condition should not obtain in the lymph node. The proliferation may take place only in one type of the cells and a lymphosarcoma will develop or all the types of cells present in a lymph node become involved and the result will be a malignant lymphoma.

I therefore conceive the pathogenesis of these conditions as follows: Both lymphosarcoma and malignant lymphoma begin as a purely local condition in one lymph node. In this lymph node either the lymphocytes or the reticulum cells or both acquire the characteristics of a cancer cell. Since these cells are very mobile they are immediately transported into other regions throughout the organism. It is possible to conceive further that these transported lymphoid tissue cells find proper medium for their multiplication and development only within the lymphoid tissue of other regions or organs (lymph nodes, spleen, bone marrow) and in these regions the secondary metastatic tumors develop.

Both lymphoma malignum and lymphosarcoma frequently show tumors in parenchymatous organs which resemble in every particular metastatic tumors of carcinoma and sarcoma. Case 3 illustrates this condition.

THE CLINICAL MANIFESTATIONS AND DIAGNOSIS OF MALIGNANT LYMPHOMA AND LYMPHOSARCOMA

The early manifestations of the disease consist in a painless swelling of one group of lymph nodes or frequently even of one lymph node. The most frequent site affected is the cervical chain of lymph nodes. There are no other clinical symptoms with the exception of occasional pruritus.

This early localized state of the disease may continue for a few weeks, months or even years but generally does not last longer than one year. Rarely does the patient die of general cachexia and asthenia before the disease begins to involve other areas.

As a rule, after a shorter or longer period the condition involves several other chains of lymph nodes or the lymphoid tissue generally and the disease becomes generalized. This change manifests itself with a rapid increase in size of the primarily involved group of lymph nodes. This is immediately followed by enlargement of lymph nodes in the other side of the body. In rapid succession then all the lymph nodes are transformed into bulky tumors. At the same time the spleen and liver become greatly enlarged, ascites and pleuritic effusion of serous, serosanguineous or chylous fluid and anascarca take place. With it appears Hodgkin's cachexia. The color of the skin of these patients (grayish brown) is so characteristic that it can be easily recognized. There develops with it a secondary anemia with either leukopenia or leukocytosis.

Frequently lymphoma malignum is accompanied by irregular attacks of fever. The cause of the fever is probably identical with the occasional fever in carcinoma and is due to absorption of dead tumor tissue, but it is apparently not an essential phenomenon of the disease since in a large percentage of cases the disease completes its course without any febrile attack.

ROENTGEN AND RADIUM THERAPY AND PROGNOSIS IN LYMPHOMA MALIGNUM AND LYMPHOSARCOMA

I [3] have ascertained in a series of clinical and experimental investigations that the lymphocytes circulating in the blood are most readily influenced by radium and roentgen rays, while all the other normal types of leukocytes and the erythrocytes possess a greater resistance.

Normal lymphoid tissue is much less radiosensitive than the various types of hyperplasias of lymphoid tissues. Furthermore, simple inflammatory hyperplasias are less radiosensitive than the neoplastic hyperplasias. The lymphoid tumors of lymphoma malignum and lymphosarcoma represent the most radiosensitive of any tissue in plants or animals. The rapid and complete

2. Kundrat: Wien. klin. Wchnschr. **6**: 211, 1893.

3. Levin, Isaac: Ann. Surg. **70**: 561 (Nov.) 1919; Action of Radium and Roentgen Rays on Normal and Diseased Lymphoid Tissue, J. A. M. A. **77**: 930 (Sept. 17) 1921; Am. J. Roentgenol. **9**: 112 (Feb.) 1922.

disappearance of large tumors of the lymph nodes is a marvelous phenomenon in medicine. The detail of this action is as follows: Under the influence of radium and roentgen rays there take place necrotization of lymphoid tissue accompanied by hemorrhages, proliferative endarteritis and ultimately replacement of the lymphoid cellular structures by dense connective tissue. A similar process takes place within an enlarged spleen when it shrinks to normal size under the influence of radium and roentgen rays.

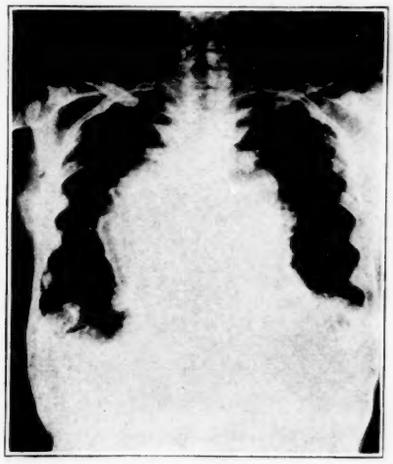

Fig. 1.—Lymphoma of the mediastinum encapsulated.

The prompt beneficial therapeutic action of radiotherapy on lymphoma malignum is the best proof that biologically it is a neoplastic condition and more akin to lymphosarcoma than to an infectious lymphoma.

The cases which will be presented later as well as many similar cases which I have under observation in institutional and private practice indicate that when treatment is begun in the early stages of the disease the life of the patient may be prolonged for many years. But as in all other types of malignancy, the patients must be under constant care and observation. The generalized conditions and cases with the involvement of the mediastinum, the retroperitoneal and peritoneal lymph nodes and organs and the central nervous system represent always far advanced stages of the disease.

None the less, in a certain number even of these cases excellent temporary palliative results may be obtained by sustained and well arranged methods of therapy.

A detailed description of the technic of radiotherapy cannot be given here. As a general rule, the dosage need not be as high as in carcinoma or sarcoma. On the other hand, the need for frequent repetition of the treatment is evident since the power of recuperation of lymphoid tissue is great. As a general rule, I prefer radium for the localized involvement of peripheral groups of lymph nodes and roentgen therapy for the generalized condition of the chest or abdomen. Generally speaking, the methods are analogous to those in other types of malignancy.

For the purpose of clinical analysis the cases of Hodgkin's disease and lymphosarcoma may be divided in the following eight groups: (1) peripheral, (2) intra-oral, (3) mediastinal, (4) intra-abdominal, (5) involving the skin, (6) involving the central nervous system, (7) skeletal and (8) Mikulicz's disease. The latter is a very rare condition which begins with a swelling of the salivary or lacrimal glands but otherwise takes the same course as the peripheral group.

This grouping is of undoubted practical value, particularly since each group of cases is generally treated by the different specialties in clinical medicine and the problem of differential diagnosis must be solved in a different way. At the same time one must not lose sight of the fact that this grouping is artificial to a great extent, and in the majority of instances, as was stated, the disease involves simultaneously many regions within the organism of the patient.

An analysis of the various groups of lymphoma malignum and lymphosarcoma follows. In order not to lengthen this presentation, I am including only a few illustrative cases. A more detailed clinical presentation may be found in my other publications and the publications of my co-workers.[4]

MALIGNANT LYMPHOMA AND LYMPHOSARCOMA OF THE SUPERFICIAL LYMPH NODES

Malignant lymphoma and lymphosarcoma of the superficial lymph nodes represent a group of cases which involves the cervical, axillary, inguinal and femoral lymph nodes. The recognition of this type is usually not difficult; the differentiation from infectious adenitis is usually made by antecedent history and the clinical course. Analysis of the blood morphology is sufficient to exclude leukemia. The differential diagnosis from tuberculous lymphadenitis as well as from metastatic carcinoma may require a microscopic analysis of biopsy material. The latter is particularly true in axillary cases. I saw two cases in which mastectomy was done for axillary Hodgkin's disease. In this group of cases, as already stated, the condition may remain localized for a long period of time but finally becomes generalized.

The following case reports may serve to illustrate the clinical course and therapeutic results in this group:

CASE 2.—J. B., a man, aged 44, was admitted to the institute, Oct. 24, 1924, with a swelling of the right side of the neck of six months' duration. Three weeks prior to admission a biopsy was done and a diagnosis of Hodgkin's disease was made. On examination there were noted several masses on the right side of the neck beginning at the angle of the mandible and running down to below the middle of the sternomastoid. A few axillary nodes were also felt. Biopsy from the right cervical lymph node showed lymphosarcoma. Radium and roentgen therapy were given. A marked improvement in the general and local condition of the patient took place and has continued to date. At present there are no lymph nodes palpated anywhere.

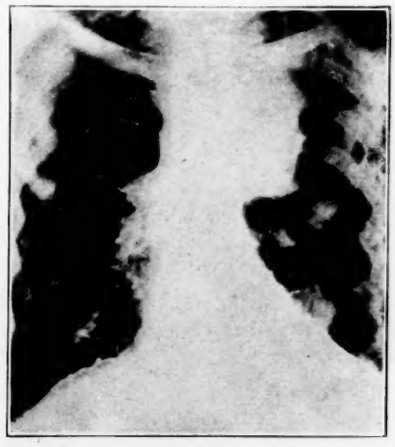

Fig. 2.—Lymphosarcoma of the mediastinum. It diffusely infiltrates the lung tissue and resembles carcinoma of the lung.

CASE 3.—I. S., a man, aged 52, was admitted to the institute, June 14, 1924, with a swelling in the left side of the neck of two years' duration. On examination, there was felt on the left side of the neck above the scar of previous operation a firm, fixed lymph node the size of an almond. There was no other adenopathy. The therapy consisted of radium applications to the neck and axillae, sixty-three treatments in all, from Oct. 14, 1924, to Dec. 27, 1928. The patient has improved clinically under care and at present there are no lymph nodes palpable anywhere. Biopsy showed lymphosarcoma.

CASE 4.—C. B., a man, aged 64, was admitted to the institute, July 1, 1924, complaining of pain in the back, dyspnea and

4. Levin, Isaac; with Joseph, B., and Norman A.: Arch. Clin. Cancer Research **4**: 31, 1929. Joseph, B., and Ehrlich, D. E.: Arch. Clin. Cancer Research **2**: 69, 1926.

loss of weight of nine months' duration. On examination, bilateral inguinal adenopathy was found. The spleen was palpated 3½ inches below the costal margin. Biopsy of an inguinal node showed lymphosarcoma. Radium applications were given to the inguinal lymph nodes and to the spleen. The patient showed marked improvement; the peripheral lymph nodes and the spleen decreased in size. June 13, 1926, the patient suddenly died from a severe hemoptysis. The autopsy showed complete absence of lymphosarcoma or enlarged lymph nodes anywhere. The cause of death was a ruptured aneurysm of the transverse arch of the aorta and pulmonary infarction.

Nearly 50 per cent of all cases of lymphoma malignum and lymphosarcoma that I have studied presented the involvement of the peripheral chains of lymph nodes only. This group responds to treatment more readily that the other groups and the results are more lasting. Patient 4 was under observation for two years with double inguinal adenopathy proved microscopically to be lymphosarcoma. At the autopsy no lymphosarcoma was found anywhere. Patients 2 and 3 were under observation for nearly five years. Other similar cases I have had under observation for as long as fifteen years. There can be no doubt that in these early cases life can be prolonged greatly by the aid of correct methods of radiotherapy.

Fig. 3 (case 10).—Mediastinal tumor before treatment.

INTRA-ORAL LYMPHOMA MALIGNUM AND LYMPHOSARCOMA

The most frequent organ involved in the mouth is the tonsil. The tonsil is enlarged and at the same time cervical adenopathy is present. Tonsillectomy is not followed by regression of the adenopathy and the tumor of the tonsil recurs. Malignant lymphoma or lymphosarcoma of the larynx is a rare condition. However, I have seen several such cases. The differential diagnosis can be made only through a biopsy, though frequently the concomitant tumor in other regions may indicate the true condition. The nasopharynx is not infrequently the seat of the disease. The symptomatology is usually the result of pressure phenomena in the involved region producing deafness, dysphagia, hoarseness and pain through involvement of the neighboring nerves.

Fig. 4 (case 10).—Mediastinal tumor after treatment.

CASE 5.—A. W., a woman, aged 53, was admitted to the institute, Aug. 17, 1827, with a lump on the right side of the neck of four months' duration. On examination there was felt at the right side of the neck anterior to the sternocleidomastoid muscle a firm, slightly movable mass measuring about 1½ inches in diameter. The right tonsil, although not enlarged, was hard and nodular in consistency. No other adenopathy was noted. The patient received radium therapy with marked improvement. Six months later the left tonsil was noted to contain neoplasia, and therapy was given to that side with a clinical improvement which continues to date. A biopsy was done that showed the presence of lymphosarcoma as well as Hodgkin's disease.

CASE 6.—E. R., a man, aged 43, was admitted to the institute, Feb. 2, 1926, with a swelling of the right side of the neck of eighteen months' duration. A tonsillectomy was done three months before admission which did not improve the condition. On examination, a tumor mass was noted on the right false cord near the intra-arytenoid space. The tumor extended into the rima glottidis and appeared ulcerated. The right tonsil was enlarged. On the right side of the neck several enlarged lymph nodes were felt. Biopsy taken from both the tonsil and the larynx showed lymphosarcoma. The patient received radium therapy and when last seen, in August, 1928, showed no tumor anywhere.

Thus, even in advanced cases of intra-oral lymphoma or lymphosarcoma good temporary results may be obtained by the aid of radiotherapy.

MEDIASTINAL TUMORS

The mediastinal tumors of lymphoma malignum or lymphosarcoma may be the only evidence of the disease

and thus presumably may represent an early localized stage. More frequently, however, it is accompanied by lymphomas elsewhere. In young patients mediastinal tumors may originate in the thymus. In adult life, however, the tumors are formed from enlargement of mediastinal lymph nodes. The roentgen analysis most frequently shows that the tumor is encapsulated, lobulated and derived from several lymph nodes.

The symptoms consist of pain in the chest, dyspnea and a dry cough. The so-called mediastinal distress that consists of dyspnea followed by orthopnea with cyanosis may be followed by sudden mediastinal death.

When the tumor breaks through the capsule and invades the lung, productive cough and hemoptysis may ensue. When the pleura is invaded, serous, serosanguineous or chylous pleuritic effusions may appear.

The diagnosis may be established by percussion and auscultation. In early cases, however, the roentgen observations may be positive before any clinical evidence is detected. In view of this, roentgen examination of the chest should be made at intervals in each case of malignant lymphoma or lymphosarcoma.

The differential diagnosis from an aneurysm of the aorta can usually be made by the aid of auscultation and fluoroscopy. From carcinoma of the lungs it is comparatively easy to differentiate the encapsulated mediastinal tumors (fig. 1), but when the tumors break into the lungs (fig. 2) the differential diagnosis may be difficult or even impossible during the life of the patient.

The following case illustrates the results of radiotherapy in mediastinal tumors:

CASE 7.—H. K., a woman, aged 29, was admitted to the institute, July 16, 1928, with a swelling on the right side of the neck and chest, dyspnea and cough of eleven months' duration. On examination, there was noted a moderate facial cyanosis, an apparent respiratory distress and slight exophthalmos. Enlarged, freely movable lymph nodes were noted in the right cervical, both supraclavicular regions and the right axilla. A definite bulging was noted on the right side of the chest. There was a hard mass noted extending from the first to the fourth interspace and to the right midclavicular line from the midsternum, shown in figure 3.

Roentgen analysis showed a mediastinal tumor. The patient received a course of radiotherapy with marked relief (fig. 4). The symptoms and the swelling of the chest wall disappeared. Biopsy showed lymphoma malignum.

Fig. 5 (case 12).—The arrows show the part of the sternum replaced by lymphoma.

The cases of mediastinal tumor observed by the author were usually in the advanced stage of the disease. Nevertheless, good palliative results may be obtained.

INTRA-ABDOMINAL LYMPHOMA MALIGNUM AND LYMPHOSARCOMA

In intra-abdominal lymphoma malignum and lymphosarcoma, the regions affected are the retroperitoneal and the mesenteric lymph nodes, the intestinal lymphoid tissue and the spleen. The initial complaint in these cases is usually one of dyspepsia or other symptoms referable to the gastro-intestinal tract or diarrhea. In cases of retroperitoneal involvement, pain in the back becomes the predominant feature. Abdominal palpation may reveal the presence of a firm, elastic tumor, fixed to the posterior abdominal wall. Roentgen analysis of the gastro-intestinal tract occasionally may reveal defects in the curvature of the stomach or in the wall of the colon caused by pressure of the tumor.

Fig. 6 (case 12).—After radiotherapy; practically normal sternum.

The most difficult cases for differential diagnosis are those in which the peripheral lymph nodes are not involved. If the case takes a febrile course and the spleen is enlarged, the condition may well be taken for typhoid.

It is doubtful whether a splenic tumor may ever be the only condition in malignant lymphoma or lymphosarcoma. Generally it is found in the late generalized stages of the disease.

Intra-abdominal lymphoma and lymphosarcoma must be kept in mind when examining patients with vague abdominal discomfort, since radiotherapy still offers more promise for palliation in this type of cases than in cases of peritoneal carcinomatosis.

LYMPHOMA MALIGNUM AND LYMPHOSARCOMA OF THE SKIN

Dermal lesions often occur in Hodgkin's disease. An itchy eczematous exanthem often marks the prodromal period of the disease. Another group of lesions, specific in nature, has rightly been termed lymphomatosis cutis, which on microscopic examination reveal the characteristic structure of lymphoma malignum. I have observed several cases of this sort.

LYMPHOMA MALIGNUM AND LYMPHOSARCOMA OF THE CENTRAL NERVOUS SYSTEM

Lymphoma malignum and lymphosarcoma of the central nervous system is generally secondary to cervical lymphoma malignum or lymphosarcoma which has extended into the cranial cavity. The symptoms in this type are usually unilateral pain (headache) and tinnitus on the affected side. Later the neurologic syndrome of neoplasm of the brain with its various localizations occurs. The course is rapid, usually rapidly fatal. A temporary clinical improvement may be noted occasionally.

SKELETAL LYMPHOMA MALIGNUM AND LYMPHOSARCOMA

The involvement of the skeleton in lymphoma malignum or lymphosarcoma generally takes place through an ingrowth of an adjacent tumor into the bone. Most frequently the parts involved are the sternum or the clavicle. The condition usually occurs in advanced cases. In generalized lymphoma malignum or lympho-

sarcoma the bone marrow is frequently involved, but this condition does not present clinical symptoms.

The following case illustrates the results of radiotherapy in this group of cases:

CASE 8.—J. S., a man, aged 39, was admitted to the institute, March 6, 1925, with a swelling on the right side of the neck. On examination there was noted a diffuse tumor on the right side of the neck and also on the chest wall over the sternum. A roentgen examination of the chest showed a localized semicircular opacity in the middle of the right side of the chest between the fourth and fifth ribs with destruction of the sternum. The patient received radiotherapy and showed marked improvement when last seen. The tumor of the chest wall disappeared and new bone formed in the sternum. The biopsy showed Hodgkin's disease microscopically (figs. 5 and 6).

This type of cases are in the advanced stages of the disease. Nevertheless, case 8 shows a remarkable response to radiotherapy.

SUMMARY

1. The clinical and pathologic study of more than 500 cases of lymphoma malignum (Hodgkin's disease) and lymphosarcoma shows that both conditions are malignant tumors.

2. Malignant lymphoma and lymphosarcoma are phases of the same pathologic entity and the two may exist in the same patient or even in the same region.

3. Inflammatory lymphadenitis may be a precursor of a malignant lymphoma or lymphosarcoma.

4. Nearly 50 per cent of all cases of lymphoma malignum and lymphosarcoma studied involved only one side of the cervical lymph nodes and were consequently in the early stages of the disease.

5. All cases ultimately become generalized. Therefore, even in the earliest localized stages of the disease, all the other groups of lymph nodes and all the lymphoid tissue must generally be considered as potentially malignant.

6. Every adenopathy the etiology of which is not certain must be carefully studied in order that a case of early Hodgkin's disease or lymphosarcoma may not be missed.

7. The methods of radiotherapy employed should be similar to the methods employed in types of cancer in which metatases in distant regions are common (carcinoma of the breast). This means that not only must the involved area be treated but also, prophylactically, the areas that are potentially malignant.

8. Were the cases of lymphoma malignum (Hodgkin's disease) and lymphosarcoma diagnosed early and correct methods of radiotherapy instituted, the therapeutic results obtained by radium and roentgen therapy would become superior to those obtained today and the prognosis would improve greatly and the life of the patient would be prolonged considerably.

30 East Seventy-Sixth Street.

Climate and the Conception Rate.—In conclusion, we may state that human fertility, as indicated by the conception rate, is highest in any given population at a temperature of about 65 F., and that it is reduced during the low temperatures of the northern winter and by mean summer temperatures above 70 F. The summer depression is roughly proportional to the rise in the mean temperature above 70 F. These changes in conception rate are not dependent on changes in the marriage rate or sexual activity of the population, and must therefore represent actual variations in human fertility.—Mills, C. A., and Senior, F. A.: Does Climate Affect the Human Conception Rate? *Arch. Int. Med.*, December, 1930.

THE INTRINSIC CARBOHYDRATE METABOLISM OF THE SKIN

A PRELIMINARY REPORT OF EXPERIMENTAL STUDIES *

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During recent years, association of a high carbohydrate intake with various disorders of the skin has gained wide clinical acceptance. The evidence for such an association is found in (1) a somewhat higher incidence of skin disorders in diabetic patients [1] and (2) blood sugar studies indicating some degree of hyperglycemia in many patients with skin diseases. These blood sugar studies are not strikingly conclusive, and on the basis of the large series of Schamberg and Brown [2] this evidence would seem to be open to question. Should it be accepted, there is still no adequate demonstration of any mechanism by which disturbance of carbohydrate metabolism may produce pathologic changes in the skin, although Usher [3] has shown that an increase in the sugar content of the sweat may lead to more favorable conditions for the growth of bacteria and fungi.

Attempts at an explanation of such a mechanism have been productive of numerous conjectures. Among these may be mentioned Kaposi's [4] idea, advanced in 1884, that some product of the decomposition of sugar acted in one of three ways, by direct stimulation of the sensory nerves of the skin with the production of pruritus, by disturbance of the secretory and vasomotor physiology of the skin, or by exogenous irritation in the excretions of the skin. Bloch [5] believes that abnormal decomposition products may become accumulative and produce toxic changes, with abnormal reaction to endogenous and exogenous agents, and Jadassohn [6] subscribes to a somewhat similar view. It is noteworthy that these observers believe that some decomposition product, not dextrose itself, is the important agent in the production of the skin disorder.

A consideration of importance is the fact that diabetic patients having a consistently high blood sugar level commonly do not develop any skin disorders whatever. From this observation it would seem to follow that individual differences in the metabolism of the skin in the presence of a high blood sugar must be presupposed; why do not all these cases develop skin disorders?

Since the available laboratory evidence for association of disturbances of carbohydrate metabolism with disorders of the skin is rather inconclusive, other lines of approach are to be sought. From recent studies it would seem that the skin has an intrinsic carbohydrate metabolism which may be studied. It is noted that (1) the skin

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* From the Department of Physiological Chemistry, D. Wright Wilson, Ph.D., director, and the Department of Dermatology and Syphilology, John H. Stokes, M.D., director, University of Pennsylvania School of Medicine.

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may serve as a temporary storehouse for large amounts of dextrose; (2) there is in man a fairly constant ratio between the dextrose content of the skin and of the blood, but that following ingestion of large amounts of dextrose this ratio may be disturbed; (3) the skin contains diastatic and glycolytic enzymes, and (4) in common with all other tissues that have been studied, skin forms lactic acid in vitro. This evidence will be considered in some detail:

1. The skin may serve as a temporary storehouse for large amounts of dextrose. Among the earliest studies of the dextrose level of the skin is the work of Palmer,[7] who found from a "trace" to 20 mg. per cent of dextrose in the skin of normal dogs having a blood sugar of from 100 to 130 mg. per cent. Higher values were obtained on ingestion of large amounts of dextrose, but Palmer states that the skin levels never approached the blood sugar values. Folin, Trimble and Newman,[8] intrigued by their inability to account for more than a small fraction of previously injected dextrose by analyses of the muscle and liver of the injected animal, performed dextrose determinations on hashes of whole guinea-pigs that had received 3 Gm. of dextrose one-half hour previously and were able to recover an average of 94 per cent of the injected dextrose. They concluded that other tissues of the body than muscle and liver must be taken into account as depots for the injected dextrose. Accordingly, comparative dextrose determinations of the blood and skin were made on fourteen fasting dogs injected with 3 Gm. of dextrose per kilogram of body weight. The skin always showed a pronounced rise in the dextrose level (values varying from 265 to 550 mg. per cent, with the level of the skin varying from a little more than half (skin 350, blood 540) to a level above that of the blood (skin 576, blood 560). In eight experiments, simultaneous determinations of the muscle gave values only from one-third to one-fourth that of the skin, no muscle value being over 154. Folin, Trimble and Newman conclude that the skin is an important outlet for sugar as it leaves the blood. They do not believe that it is more than a temporary storage place for dextrose because, in the fasting animal, they state that the skin contains practically no glycogen, and only about 10 mg. per cent more dextrose than the muscles. Their finding of markedly increased storage of dextrose in skin over muscle is, however, a finding of some significance. Either dextrose does not diffuse as rapidly into muscle as into the skin, or muscle rapidly transforms the diffused dextrose into other substances.

2. There is in man a fairly constant ratio between the dextrose content of the skin and of the blood, but following ingestion of large amounts of dextrose this ratio may be disturbed. This statement is based on the work of Urbach and Fantl[9] and Urbach and Sicher,[10] which is a direct clinical corollary of the work of Folin, Trimble and Newman. Urbach and Fantl repeated the experiments of Palmer[7] and obtained similar low results. They concluded that, because of the viscous nature of the skin filtrates, much of the dextrose was retained. By using another method of extraction, with determination of the reducing substances by the Hagedorn-Jensen method, much higher results were obtained. Comparative determinations of blood and skin dextrose levels by Urbach and Fantl[9] in an adequate number of dogs, guinea-pigs, rabbits, mice and men indicated that a fairly definite ratio between the blood and skin dextrose content exists in individual species. In man and the mouse, the skin dextrose content was about half that of the blood; in rabbits, guinea-pigs and rats, the skin dextrose was as high as or higher than the blood sugar, and in dogs it was about one third. In comment, it is noted that the observations in dogs do not agree entirely with those of Folin, Trimble and Newman,[8] and acceptance of results indicating a constant ratio between the blood and skin dextrose levels in individual species must await confirmation. The samples of skin, obtained by a punch biopsy 1 cm. in diameter, are rather small for adequate dextrose determination, but Urbach and Fantl[9] report close agreement of values for skin samples from the same animal.

In applying this method to clinical study, Urbach and Sicher[11] performed simultaneous blood and skin dextrose tolerance tests; i. e., samples of skin and blood were taken before and one-half, one, two and three hours after the ingestion of 100 Gm. of dextrose, making in the average case studied five blood and skin dextrose determinations. The numerous biopsies were obtained by a rapidly rotating motor-driven punch 1 cm. in diameter. It was found that, in "normal" individuals in which the resting value of skin dextrose was from 40 to 50 per cent of the blood sugar, the maximum level of skin dextrose was reached in one hour following the ingestion of 100 Gm. of dextrose. The rise was not as abrupt or nearly as high as the blood sugar, but whereas the blood reached the fasting level in two hours, the skin commonly required three hours to return to its original level. In normal cases the skin sometimes reached a value 20 mg. per cent below that of the blood but did not equal it. A second type of curve noted was that in which both the blood and the skin reached very high values (260 in the skin), the maximum being delayed for two or three hours, and in which the blood and skin required a much longer time, often five hours, to regain the fasting level. Urbach and Sicher term this the diabetic blood and skin dextrose tolerance curve, and have noted it in cases of pruritus, eczema, furunculosis and gangrene.

A third type of curve, which Urbach and Sicher call the sympathetic endocrine, is one in which the blood reaches a very high level (320) within an hour and rapidly falls, with no abnormal increase in the height of the skin sugar curve. In this group have been noted cases of ulcer cruris and chronic ulcerative pyodermia. In contrast to this third type is one in which the skin dextrose level may exceed that of the blood. The blood sugar increase is normal; in the skin, from a slightly increased resting value there occurs a rise to a fairly high level (120), with a very slow return to normal. In one such curve, at the end of two hours the skin dextrose equaled that of the blood and in three hours exceeded the blood value by almost 20 mg. per cent. Urbach and Sicher consider this phenomenon an evidence of latent diabetes, but whatever the interpretation, the intersecting blood and skin sugar curves represent a retention of dextrose by the skin and a disturbance of the normal ratio of skin dextrose to blood dextrose.

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11. Urbach and Sicher (footnote 10, first reference).

3. The skin contains glycolytic and diastatic enzymes. Przylecki [12] first observed the presence of amylase and diastase in the skin of the frog. Wohlgemuth and his co-workers,[13] in an extensive series of papers, have demonstrated the presence of various enzymes in the skin, among which is diastase. They report a wide variation in the diastase content of the skin, and state that human skin contains less diastase than the skin of other animals, but that the human skin diastase content is scarcely less than that of the liver.

4. In common with all other tissues that have been studied, skin forms lactic acid in vitro. Fahrig,[14] in a study of the lactic acid formation by various tissues, including skin, concluded that skin is capable of transforming dextrose into lactic acid. Wohlgemuth and Ikebata [15] almost simultaneously came to a similar conclusion in the course of their enzyme studies on skin. The resting lactic acid value of skin, as determined by these investigators, is open to possible revision because of the slowness with which the tissue was prepared. Fahrig,[14] in view of the long periods of incubation employed, did not feel that the possibility of bacterial action was eliminated in his experiments.

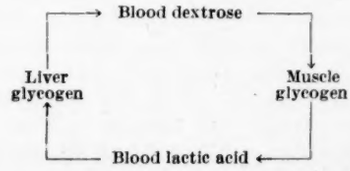
Mention should be made of the available data on the glycogen content of the skin. Wohlgemuth and Yamasaki [16] assumed that the skin plays only a small rôle in glycogen formation on the statement of Unna [17] in 1907 that only very small amounts of glycogen are demonstrable in skin. Folin, Trimble and Newman [8] state that skin contains practically no glycogen. Palmer [7] and Urbach and Sicher [18] mention the rapid increase in skin dextrose due to postmortem glycogenolysis, a statement inferring the presence of not inconsiderable amounts of glycogen. Fahrig [14] found values of from 226 to 344 mg. per cent of glycogen in the epiderm, and from 71 to 157 in the corium of human skin. Warren,[19] although not citing figures, states that "moderate" to "marked" amounts of glycogen are the rule in nondiabetic skins, and that skin from diabetic patients shows lower levels, a most interesting observation. The need for more exact data on the glycogen level of the skin is apparent.

The formation of lactic acid in the skin is the method of study used in these experiments. That lactic acid formation in vitro is due to the activities of living cells and not to autolytic postmortem changes has been shown by Warburg,[20] who observed marked lactic acid formation in cancer tissue which, in Ringer's solution, remained alive and transplantable for three days. It may be confidently stated, therefore, that in vitro studies, especially of tissues observed for only short periods after removal, may yield information concerning functional activities of tissue in vivo.

The large amount of work on lactic acid as an important part of the carbohydrate cycle has received little mention in clinical literature, and several of the more important studies will be reviewed to aid in an interpretation of the results of the present study of the skin. Fletcher and Hopkins,[21] in 1907, proved that lactic acid is produced in muscle during exercise, and asserted that lactic acid is an important product in the intermediary decomposition of carbohydrates. Meyerhof [22] has shown that in the production of lactic acid on muscular exertion there occurs a corresponding decrease in glycogen, and that if a muscle is repeatedly stimulated in an alkaline medium, glycogen entirely disappears. He has also shown that lactic acid disappears in muscle in the presence of oxygen, three out of every four molecules being resynthesized into glycogen.

Otto von Fürth [23] found that in fasting rabbits poisoned with phosphorus there occurred no excretion of lactic acid but that, following ingestion of dextrose, lactic acid was excreted in fairly large amounts. Katayama [24] states that a rise in blood lactic occurs following injection of dextrose. Embden [25] has found that, on perfusion of liver that contains no glycogen, no increase in lactic acid occurs, while in liver rich in glycogen marked formation of lactic acid is demonstrable. The Coris [26] have found that sodium *d*-lactate, when fed by mouth or injected subcutaneously, leads to glycogen deposition in the liver in an amount equal to from 40 to 95 per cent of the *d*-lactate absorbed.

To summarize the present knowledge concerning the place of lactic acid in the carbohydrate cycle, of which knowledge the foregoing references represent outstanding examples of an extremely large and constantly increasing bibliography, it may be said to have been satisfactorily demonstrated that glycogen is synthesized from blood dextrose in the liver and probably in the muscles, that lactic acid is formed from muscle glycogen during exercise, and that much of the lactic acid so formed is resynthesized into glycogen by the muscles and the liver. This may be represented schematically by a diagram as taken from the article by the Coris: [26]



As previously stated, most tissues are capable of forming lactic acid in vitro. This lactic acid formation occurs only at the expense of carbohydrate material and furnishes a convenient index of the carbohydrate metabolism of the tissue studied. The present experiments have consisted of (1) determinations of the lactic acid content of the normal skin of starved and well fed animals, and (2) a study of the formation of lactic acid on the incubation of skin samples.

EXPERIMENTAL

Method.—The skin of rabbits was usually employed. It was found that the skin over the midportion of the abdomen was most easily and quickly dissected from

12. Przylecki, St. J.: Proprietes digestives de le peau des grenouilles, Arch. internat. de physiol. **22:** 219-224, 1923.
13. Wohlgemuth, V., and Sugihara, N.: Die Fermente der Haut: III. Vergleichende Untersuchungen über den Fermentgehalt frischer Haut von Mensch und Tier und über den Einfluss verschiedener Lichtarten auf die Haut, Biochem. Ztschr. **163:** 260-270, 1925. Yamasaki, Y.: Ueber die Fermente der Haut, ibid. **147:** 203-215, 1924.
14. Fahrig, C.: Ueber den Kohlenhydratunsatz der Geschwulste und ihrer normalen Vergleichsgewebe sowie seine Beziehung zum Milchsaureaushalt des Korpers, Ztschr. f. Krebsforsch. **25:** 146-228, 1927.
15. Wohlgemuth, J., and Ikebata, Toshisuke: Die Fermente der Haut: VIII. Ueber Milchsaurebildung in der Haut und ihre Beeinflussung durch verschiedene Strahlenarten, Biochem. Ztschr. **186:** 43-53, 1927.
16. Wohlgemuth, V., and Yamasaki, Y.: Ueber die Fermente in der Haut, Klin. Wchnschr. **3:** 1113-1114 (June 17) 1924.
17. Unna, P. G.: Ueber Verhornung, Med. Klin. **5:** 1727 (Nov.) 1909.
18. Urbach and Sicher (foonote 10, second reference).
19. Warren, Shields: The Effect of Insulin on Pathologic Glycogen Deposits in Diabetes Mellitus, Am. J. M. Sc. **179:** 482-488 (April) 1930.
20. Warburg, O.; Posener, K., and Negelein, E.: Ueber den Stoffwechsel der Carcinomzelle, Biochem. Ztschr. **152:** 309-344, 1924.
21. Fletcher, W. M., and Hopkins, F. G.: Lactic Acid in Amphibian Muscle, J. Physiol. **35:** 247-309, 1907.
22. Meyerhof, O.: Die Energiumwandlungen im Muskel, Biochem. Ztschr., 1924.
23. von Fürth, Otto: Ueber die Beziehung der Milchsaure zum Kohlenhydratstoffwechsel, Biochem. Ztschr. **69:** 199, 1915.
24. Katayama, Ichiro: The Significance of Changes in the Composition of the Blood and Urine After Ingestion of Glucose, J. Lab. & Clin. Med. **11:** 1024-1034 (Aug.) 1926.
25. Embden, G., and Kraus, F.: Ueber Milchsaurebildung in der künstlich durchssromten Leber, Biochem. Ztschr. **45:** 1-17, 1912.
26. Cori, C. F., and Cori, Gerty T.: Glycogen Formation in the Liver from d- and l-Lactic Acid, J. Biol. Chem. **81:** 389-403 (Feb.) 1929.

the subcutaneous tissues, and only skin from this area, which had been previously clipped and shaved, was used. It was felt that specimens thus obtained represented the least possible amount of tissues other than dermal.

The majority of experiments were performed on animals under iso-amylethyl barbituric acid anesthesia, although determinations on skin from stunned animals were made for comparison. On induction of complete anesthesia the sample of skin, from 1.5 to 4 Gm. in weight, was quickly dissected off, cut into strips, and dropped into a tared vessel containing ice-cold 5 per cent trichloracetic acid. In some experiments samples of skin were placed in a mortar containing liquid air, where they were instantly frozen.

TABLE 1.—*Lactic Acid in Frozen and Sliced Skin and Lactic Acid Formed on Incubation.**

Experiment	Preparation	Initial Lactic Acid	Incubation in 2% $NaHCO_3$, 37 C.	Lactic Acid After Incubation
2	Frozen	129	.....	...
3	Frozen	122	.....	...
6	Frozen	61.3	2 hours	68
	Sliced	61.5	2 hours	145
10	Frozen	45	.....	...
	Sliced	46	.....	...
11	Frozen	84	4 hours	100
	Sliced	70	4 hours	188
18	Frozen	60	6 hours	77
	Sliced	71	6 hours	271

* All values in the tables are in milligrams per hundred grams of skin.

The tissue was weighed to centigrams and extracted in trichloracetic acid for twelve hours or longer. The contents of the flask were thoroughly agitated and filtered. Aliquot portions of the filtrate were made alkaline to litmus, and carbohydrate substances were removed by the Van Slyke-Clausen procedure involving the use of copper sulphate and calcium hydroxide. Lactic acid was determined by the method of Friedemann, Cotonio and Shaffer,[27] with the modifications suggested by Friedemann and Kendall.[28] The collecting apparatus for small amounts of lactic acid described by the Davenports[29] was found to permit of slightly more accurate titration and was used throughout these experiments. Determinations of pure zinc lactate, performed at intervals throughout the course of this study, gave recoveries of from 97 to 99 per cent. All lactic acid determinations were made in duplicate.

Effect of Preliminary Freezing of the Skin.—In muscle it is well known that minimum lactic acid values are obtainable only when means for rapid inhibition of the metabolic processes are employed. One of the most satisfactory of these methods is preliminary freezing of the tissue by liquid air. Several experiments using this method were performed, in some of which direct comparison of the value thus obtained could be made with skin from the same animal prepared by the slightly less rapid method of slicing the skin and dropping it into cold trichloracetic acid. Besides determinations of the lactic acid content of the skin on removal, portions were placed in bicarbonate solution and allowed to digest at 37 C. for varying lengths of time. The lactic acid formed during incubation was then determined. The results are given in table 1.

Comparison of the lactic acid content of skin from the same animal, in which one specimen was sliced and dropped into cold trichloracetic acid and another frozen in liquid air, ground, and similarly extracted, does not reveal significant differences. In other words, lactic acid formation in skin is sufficiently slow to permit slicing and precipitation with ice-cold trichloracetic acid without change in lactic acid concentration.

Formation of lactic acid on incubation, a phenomenon which later experiments will show to be consistently demonstrable, is apparently seriously interfered with by freezing. Two possible explanations of this observation may be offered: inactivation of the enzymes of the skin by the low temperature of liquid air, or by the cellular destruction produced by freezing and grinding.

In table 2 are set down a series of resting lactic acid values obtained from the skin of well fed and of starved rabbits, prepared by slicing and extraction in ice-cold trichloracetic acid. The time required for dissection and slicing was about one minute. In the experiments marked S the rabbits were killed by stunning; the remainder were under iso-amylethyl barbituric acid anesthesia.

It will be noted that the lactic acid content of the skin shows a wide variation in well fed animals. In experiment 4, extremely vigorous muscular contractions occurred on stunning, and the high value observed was probably due to this factor. The other values are on animals which did not struggle, although complete relaxation is difficult to obtain, even under anesthesia with iso-amylethyl barbituric acid. The values obtained in skin from starved animals are distinctly lower. A similar tendency to low levels in the liver of starved animals has been demonstrated by Bott[30] in our laboratory. The starved rabbits were given from 125 to 150 cc. of water by intubation daily. The importance of an adequate water intake was shown in an experiment in which the animal was both starved and deprived of water and in which the resting lactic acid value was 140 mg. per cent.

TABLE 2.—*Resting Lactic Acid Values of Skin from Well Fed and Starved Rabbits.*

	Experiment	Lactic Acid
Well Fed Rabbits		
	4 (S)	138
	9	103
	11 (S)	70
	12	82
	15	87
	17	84
	18 (S)	71
	19	125
	21	78
	27	94
	28	88
Starved Rabbits		
2 days	6	61
10 days	14	50
6 days	24	60
7 days	26	56
4 days	29	42

Lactic Acid Formation by the Skin on Incubation in Vitro.—Most of the experiments have been performed with a 2 per cent solution of sodium bicarbonate as an incubating medium. From 1.5 to 2.5 Gm. of skin, either whole or sliced, were suspended in 10 or 15 cc. of a 2 per cent solution of sodium bicarbonate. Unless

27. Friedemann, T. E.; Cotonio, Margherita; and Shaffer, P. A.: The Determination of Lactic Acid, J. Biol. Chem. **73**: 335-358 (May) 1927.

28. Friedemann, T. E., and Kendall, A. I.: The Determination of Lactic Acid, J. Biol. Chem. **82**: 23-43 (April) 1929.

29. Davenport, H. A., and Davenport, Helen K.: The Lactic Acid Content of Resting Mammalian Muscle, J. Biol. Chem. **76**: 651-658 (March) 1928.

30. Bott, P.: Personal communication to the author.

otherwise stated, the specimens were allowed to stand in air, and oxidations were therefore not prevented. A temperature of 37.5 C. is optimum for lactic acid formation. It has been held desirable that bacterial action be prevented. Wohlgemuth and Ikebata [15] and Fahrig [14] have used ethylhydrocupreine (optochin) for this purpose, but MacLeod [31] has objected to the use of this substance on the evidence of Gee and Chaikoff,[32] who found, by bacteriologic examination of blood filtrates containing ethylhydrocupreine, that it was not markedly bacteriostatic. Fletcher [33] has found that chloroform-saturated solutions are efficient for this purpose and accordingly the effect of chloroform on lactic acid formation was studied.

TABLE 3.—*Lactic Acid Formation by Skin in Vitro in a 2 Per Cent Solution of Sodium Bicarbonate at 37 C.*

Experiment	Animal	Initial Lactic Acid	Period of Incubation	Final Lactic Acid
4	Rabbit	138	2 hours	272
6	Rabbit	61	2 hours	145
7	Man	57	6 hours	100
8	Rat	70	6 hours	188
9	Rabbit	70	4 hours	180
13	Man	83	6 hours	202
14	Rabbit	50	6 hours	178
15	Rabbit	87	4 hours	175
17	Rabbit	84	1 hour	157
18	Rabbit	71	6 hours	271
21	Rabbit	78	4 hours	189
24	Rabbit	60	4 hours	207
26	Rabbit	56	4 hours	145
27	Rabbit	101	4 hours	276
28	Rabbit	88	4 hours	204
30	Rabbit	94	4 hours	222

From these results it is seen that (1) bacterial action is not an important factor in the lactic acid formation, at least in short periods of incubation, and (2) chloroform does not interfere with the formation of lactic acid by the skin.

In table 4 are outlined a series of results of the incubation of skin in a 2 per cent solution of sodium bicarbonate $NaHCO_3$ (chloroform-saturated), over varying periods of time.

The formation of lactic acid by skin in vitro in variable amounts is consistently observed. The reason for the variability of increase is not apparent. It may be that the age of the animal is a factor, since Warburg and his associates [20] have shown that in embryonic tissue the glycolytic activity is more marked, and Hawkins [34] has observed a similar tendency in the liver of very young rats. The amount of available carbohydrate precursor is probably a factor also.

TABLE 4.—*Lactic Acid Formation by Nonsterile Skin in Bicarbonate Solution with and Without Chloroform, 37 C.*

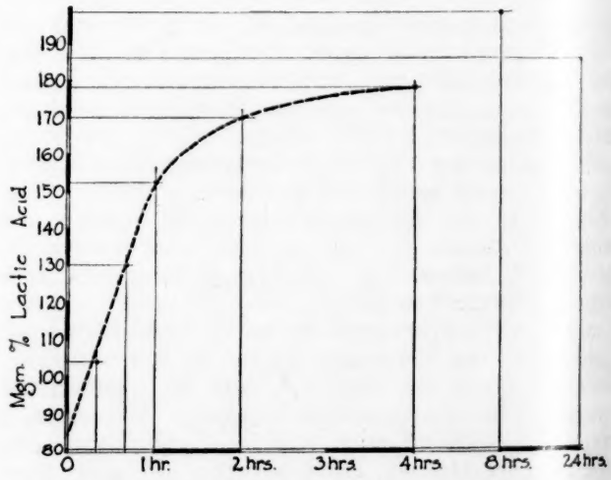
Experiment	Lactic Acid	Incubation	Incubated in 2% $NaHCO_3$	Incubated in Chloroform-Saturated 2% $NaHCO_3$
11	70	4 hours	137	137
9	103	4 hours	253	256

The chart is a graphic representation of lactic acid increase in skin from the same animal incubated for varying periods (experiment 17).

Rapid lactic acid formation at first, with less rapid increase later, is typical of enzyme action. This curve is distinctly of this type. If the lactic acid formation were due to bacterial action the increase would be slow at first, with marked acceleration later.

Influence of Dextrose Glycogen and Phosphate Buffer Solutions on Lactic Acid Formation by Skin.—In these experiments the increase in lactic acid in a 2 per cent solution of sodium bicarbonate, phosphate buffer as prepared by the Davenports,[29] a 0.2 per cent solution of dextrose in bicarbonate and phosphate buffer solution and 0.2 per cent glycogen in bicarbonate solution was compared. It should be again noted that only determinations on skin from the same animal are suitable for direct comparison. The influence of phosphate buffer solution is of interest because it is known that lactic acid production by muscle is greater in this medium and because of Embden's conclusion that a hexosephosphate is a precursor of lactic acid in muscle. Fahrig [14] has reported greater production of lactic acid by skin in dextrose-phosphate solution.

On incubation of skin from the same animal, a much greater rise in lactic acid occurs in solutions containing dextrose than in those not containing dextrose, indicating that the added dextrose is productive of increased lactic acid formation by the skin. In phosphate solution containing dextrose, the rise in lactic acid is even greater, indicating that the presence of the phosphate ion increases the utilization of dextrose. The results obtained with glycogen solutions are indeterminate but do not show the same tendency toward high values as do the solutions containing dextrose. In this connection it should be remembered that glycogen forms colloidal solutions and does not diffuse into the tissue, where enzyme activity is taking place.



Relation of time of incubation (abscissa) to lactic acid increase (ordinate). Incubation in 2 per cent sodium bicarbonate at 37.5 C.

A somewhat different approach to an appreciation of the effect of dextrose has been employed as follows: In anesthetized rats and rabbits, a sample of skin for determination of the resting lactic acid value and for incubation were removed. Three grams of dextrose per kilogram of body weight were then injected into the blood stream. Thirty minutes after injection another sample of skin was taken for incubation. It can be stated that the resting lactic acid content shows little change in this time. The results are outlined in table 6.

From the work of Folin, Trimble and Newman,[8] it may be assumed that animals injected with such a large

31. MacLeod, J. J. R.: The Fuel of Life, Princeton, N. J., Princeton University Press, 1928, p. 109.
32. Gee, A. H., and Chaikoff, I. L.: The Identification of Acetaldehyde in Normal Blood and Its Quantitative Study in the Blood of Normal and Diabetic Dogs, J. Biol. Chem. **70**: 151 (Sept.) 1926.
33. Fletcher, W. M.: On the Alleged Formation of Lactic Acid in Muscle During Autolysis and in Postsurvival Periods, J. Physiol. **43**: 286-312, 1911.
34. Hawkins, J. A.: The Metabolism of Liver Tissue from Rats of Different Ages, J. Gen. Physiol. **11**: 645-647 (May 20) 1928.

amount of dextrose have absorbed considerable quantities into the skin. Apparently skin containing abnormal amounts of dextrose is capable of forming lactic acid in vitro at an increased rate.

COMMENT

Attention is again directed to the opinions of Kaposi,[4] Bloch[5] and Jadassohn[6] that some decomposition product of carbohydrate material is the agent most

TABLE 5.—*Effect of Phosphate Buffer, Dextrose, and Glycogen Solutions on Lactic Acid Formation by Skin in Vitro. Incubation Four Hours. 37 C.*

Experiment	Initial Lactic Acid	2% $NaHCO_3$	PO_4 Buffer	0.2% Dextrose in 2% $NaHCO_3$	0.2% Dextrose in PO_4 Buffer	0.2% Glycogen in 2% $NaHCO_3$
21	78	189	242	...	466	315
30	94	222	228	...	507	...
27	101	276	...	447	580	...
28	88	204	...	339	368	...
19	125	177	...	...	...	190

probably concerned in the production of pathologic changes in the skin in association with disturbed carbohydrate metabolism. No experimental basis for this hypothesis is available. Whether metabolically produced lactic acid can cause pathologic changes in the skin it is impossible to say. It is believed that the chief value of these experiments lies in the adaptability of the method to the study of the metabolism of the skin in pathologic conditions. At present there is no indication that marked changes in the lactic acid content of normal skin may occur, other than some lowering of the value in starvation.

It is well established that a high lactic acid level has a pronounced influence on the physiology of muscle. After the acidity has reached a certain point, as a result of the increase of lactic acid, contraction is no longer possible. It is not improbable that changes in the lactic acid content of the skin would produce a change in the p_H. The effect of changes in the p_H and the factors producing them have been the subject of recent study.

Leake, Hall and Koehler,[35] in a study of the effect of changes in the acidity of perfused buffered phosphate solution on the blood vessels of frogs, found that maximum dilatation of the blood vessels occurred in the neighborhood of p_H 7.2. A change of the p_H in

TABLE 6.—*Lactic Acid Formation in Vitro by Skin Removed Before and After Infection of 3 Gm. Dextrose per Kilogram into Blood Stream.**

Experiment	Initial Lactic Acid	Skin Taken Before Dextrose Injection	Skin Taken After Dextrose Injection
12 (rabbit)	82	176	349
29 (rabbit)	42	164	252
16 (rat)	68	...	398

* Incubation four hours, 37 C., 2 per cent sodium bicarbonate.

either direction produced vasoconstriction, although this was more marked on the alkaline side. Addition of the lactate ion to the perfusing fluid greatly diminished the constricting effect of alkalinity and acidity. They offered the suggestion that lactic acid may assist materially in dilating blood vessels and maintaining adequate circulation. The possibility of the production of erythema of the skin by lactic acid is obvious.

35. Leake, C. D.; Hall, F. G., and Koehler, A. E.: The Influence of the Hydrogen Ion Concentration on Vascular Toxicity, Am. J. Physiol. **65**: 386-394 (July) 1923.

Bazett and McGlone[36] have demonstrated marked acidity changes in the skin of the cat. The acidity rises directly with the temperature and is increased on the production of circulatory arrest by constriction. The increased acidity may persist for from five to ten minutes after the reestablishment of normal conditions. Bazett and McGlone suggest that the vascular dilatation in acidity may be due to acid metabolites formed during arrest of the circulation.

It is known from the experiments of Stokes,[37] of Van Leeuwen and his associates[38] and of Harris[39] that on removal of skin there occurs a formation of substances which produce erythema, wheals and vesicles on the reinjection of the skin extract into the skin of the same or of another individual. It would appear that in skin, on removal from the organism, there occurs an appearance of increase of some substance capable of producing pathologic changes on reinjection. Harris[39] reports no marked increase in this effect on delay in extraction of the skin, and this would point against the lactic acid formed being responsible for the irritation.

It can be shown that pure lactic acid solution, when injected into the skin of a normal individual in a concentration only slightly above that normally present in the skin, will produce definite erythema and some pruritus about the site of injection much more marked than the control, and that the effect increases with the lactic acid

TABLE 7.—*Lactic Acid Formation by Skin in Air and in Nitrogen.**

Experiment	Initial Lactic Acid	Incubated in Air	Incubated in Nitrogen
24	60	207	211
26	56	145	152

* Two per cent sodium bicarbonate, 37 C., four hours.

concentration of the injected solution. This effect is probably due to the H ion, but it suggests a possible effect of lactic metabolically produced, if insufficiently buffered.

The possibility of lactic acid being a factor in promoting infections of the skin is suggested by the work of Hall and Fraser,[40] in which they found that the presence of lactic acid in one hundred and sixty-sixth normal strength in a casein medium, the p_H being adjustable to 7.6, markedly increased the growth of bacteria. Salicylic acid in similar concentration inhibited bacterial growth. Von Fürth and Lieben[41] have shown that, in the presence of oxygen, yeast rapidly transforms lactic acid into sugar. Irala[42] reports that lactic acid in a concentration of 50 mg. per cent checks phagocytosis markedly. Evans[43] also found that lactic acid has a specific toxicity for leukocytes.

It is probable that in normal living skin the lactic acid formed above a certain level rapidly disappears. It can be stated that it does not rise appreciably, even on

36. Bazett, H. C., and McGlone, B.: The Effects of Temperature on the Acidity of the Skin, J. Physiol. **64**: 393-404 (Feb.) 1928.
37. Stokes, J. H.: Studies on Intradermal Sensitization: I. Intradermal Reactions to Emulsions of Normal and Pathologic Skin, J. Infect. Dis. **18**: 402-414 (April) 1916.
38. Van Leeuwen, W. S.; Bien, Z., and Varekamp, H.: Diagnosis of Diseases of Hypersensitiveness, Nederl. tijdschr. v. geneesk. **2**: 2276-2279 (Nov. 18) 1922.
39. Harris, K. E.: Histamine-Like Substance in Skin Extracts, Heart **14**: 161-176 (Dec. 21) 1927.
40. Hall, I. W., and Fraser, A. D.: The Action of Dilute Acids on Bacterial Growth in Optimum Hydrogen Ion Concentration, J. Path. & Bact. **25**: 19-25 (Jan.) 1922.
41. von Fürth, Otto; and Lieben, F.: Milchsaürestorüng durch Hefe und Blutzellen, Biochem. Ztschr. **144**: 168, 1922.
42. Irala, J.: Ricerche sulla fagocitosi, Ann. d'ig. **30**: 28-34, 1920.
43. Evans, A. C.: The Toxicity of Acids for Leukocytes as Indicated by the Tropin Reaction, J. Immunol. **7**: 271-304 (May) 1922.

injection of large amounts of dextrose into the blood stream. The question as to whether any appreciable rise may occur in abnormal skin and whether a high lactic acid content is productive of any gross physiologic changes cannot be answered at present.

A consideration of more importance is the possible place of the skin as an organ of considerable influence in the carbohydrate metabolism of the organism as a whole. Urbach and Sicher[18] from the tables of Vierordt,[44] have calculated the weight of the skin as about one-sixth that of the entire body, its bulk surpassing that of the liver, and have pointed out that the demonstration of even moderate metabolic functions in the skin would reveal it as an organ whose importance in the carbohydrate metabolism of the body is far more than incidental.

SUMMARY

1. Lactic acid, an important product of carbohydrate metabolism, is normally present in the skin.

2. Lactic acid formation in vitro is a consistently demonstrable finding in normal skin, except when the skin has been previously frozen.

3. Decreased oxygen tension has no significant effect on in vitro lactic acid formation by the skin.

4. In the presence of dextrose in the incubating medium, especially in phosphate buffer solution, lactic acid formation is increased.

5. The skin of animals previously injected with dextrose forms lactic acid in vitro in increased amounts.

6. The lactic acid level of skin tends to be low in starved animals and higher in well fed animals.

CONCLUSION

The preliminary experiments indicate that a specific carbohydrate metabolism of the skin may be observed experimentally. Further study of the skin under abnormal conditions is contemplated.

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ABSTRACT OF DISCUSSION

DR. UDO J. WILE, Ann Arbor, Mich.: The biochemistry of the skin is a field so new and so full of possibilities for the explanation of disease phenomena that further research along these lines is urgent. Up to quite recent times, the skin has been regarded from its physiologic and anatomic aspects. Its functions have been assumed to be excretory, secretory and protective. The concept of it as an organ intimately concerned with complex chemical processes adds increasing importance to it, not only for its own pathologic conditions but also from its relation to general body chemistry. It has long been known that the epithelium is a structure actively functioning in the elaboration of complex molecules, particularly in the elaboration of keratin from keratohyalin. More lately, it has been learned how intimately the skin is concerned with the elaboration of lipid substances. It has been shown that the cutaneous covering may play an important part in the metabolism of carbohydrates. I wonder whether it is understood that the carbohydrate metabolism of the skin is being dealt with as a whole or whether this refers to the metabolism of the epithelium alone, or the cutis alone, or both. The distinction between these should be definite, since it is well known that in the elaboration of other substances than carbohydrates particular differences exist in the chemistry of the same substance in the cutis and in the epidermis. The demonstration of lactic acid as an end-product of carbohydrate metabolism is extremely interesting. It is well known that lactic acid occurs in muscle elaborated from glycogen as a by-product of fatigue and that rigor mortis is directly the result of the production of postmortem lactic acid. The demonstration of this substance, therefore, in the living skin is an important contribution. It is a proper assumption that if this process occurs in the skin of the rabbit it is more than likely that a similar change occurs in the human being. The definite demonstration of this would depend on carefully controlled experiments on the human being. The practical application of this study is perhaps in the remote future. However, it is not venturing too far in speculation to assume that many disease processes of unknown etiology, as well as those insults which are caused by known agents, may find their ultimate explanation in derangement from the normal in the metabolism of both epidermis and cutis, as these affect carbohydrates, protein, lipids and salts.

DR. JOHN H. STOKES, Philadelphia: The section may be interested in the administrative problems involved in a research such as this. The pertinacity and determination of the investigator and the enormous amount of work involved cannot appear in this report. Moreover, the extraordinary and generous directional aid of Prof. D. Wright Wilson of the department of physiologic chemistry of the University of Pennsylvania is a vital element in this study. As the dermatologist responsible for the administrative aspects, I may say that this investigation is based, first, on the belief that study of function has now superseded in importance the mere study of the structural anatomy of the skin in health and in disease. Secondly, it is based on the belief that in dermatology at least the attack for the time being should be on the problems of the normal rather than on the abnormal skin. Dermatology suffers seriously from the fact that the skin has been treated and thought of as if it were merely a covering of rubberoid rather than an integral part of the organic mechanism of the body as a whole. One of the most valuable effects of a study such as this is to show that the skin is an organ in close organic relationship to the general problems of behavior and metabolism of the body. Third, we have accepted it as a principle that the period of naive blood chemical study in cutaneous disease is passing, for it was based on the impression that because the blood circulates in all structures it contains the alpha and omega of their intimate chemistry. Many common conditions of the skin give every evidence of leaving no trace on the chemistry of the blood. The disturbance is in the organic metabolism of the skin. A fourth administrative principle here involved is that of equipping every man who enters this special field with a single scientific instrument of attack. The use of this instrument becomes his research metier and the combination of the right man and an effective instrument is certain to produce tremendous advances in knowledge. The choice of a method is less satisfactorily made by a dermatologist than by a leader in one of the fundamental medical sciences. The dermatologist may, as in this case, envisage the problem which needs to be attacked, but for the selection of method he must appeal to the highly trained biochemist.

DR. KARL ZWICK, Cincinnati: That morphologic changes in the skin are accompanied by chemical—that is metabolic—processes is indicated by alterations of the tinctorial qualities of the tissues. But in order to gain a more intimate understanding of the dynamic processes occurring in the cutaneous tissues, histologic observation should be supplemented by investigation of the metabolism of the skin. Here the work of Dr. Pillsbury, undertaken at the instigation of Dr. Stokes, reveals what may be accomplished by the application of the biochemical methods of Meyerhof, Wohlgemut, Warburg, Embden and others, to the study of the intrinsic metabolism of the skin. Refinement of technic may, eventually, enable one to differentiate the chemical processes in the various strata of the skin. Dr. Pillsbury is cultivating a promising field of research.

DR. DONALD M. PILLSBURY, Philadelphia: Regarding Dr. Wile's and Dr. Zwick's remarks on determining the difference in function of the epidermis and cutis, I know of nothing that has been done on that score. An attack is being planned but one has not yet been adopted which is thought feasible. Dr. Wile's remarks about not too readily accepting this as analogous to the human skin are apropos. The human being is an interesting animal to study. However, one is unable to get specimens from patients not anesthetized with ether or gas, and that destroys the carbohydrate function. Only isoamylethylbarbituric acid has no influence in this regard.

44. Vierordt, H.: Anatomische, physiologische und physikalische Daten und Tabellen, Jena, Gustav Fischer, 1906, p. 44.

COMPLETE RUPTURE OF THE SUPRASPINATUS TENDON *

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It is a trite remark to say that there is no teacher like experience, but it is unfortunately a truism which, when applied to surgery, carries unpleasant implications for the patient. My excuse in offering this paper is to record a personal experience in relation to injuries of the shoulder and to present the conclusions I have drawn from it in the hope that they may be of benefit to other surgeons. In the last eighteen months I have come to realize that complete rupture of the supraspinatus tendon is a common lesion. During that period I have made this diagnosis in ten patients, of whom seven have submitted to operation, at which time I was able to confirm the diagnosis and repair the tendon. Previous to this, in a surgical experience covering approximately sixteen years, I had made this diagnosis only twice. I am convinced from what I have learned in these recent cases that I had previously seen many of these injuries without recognizing the real condition. I am equally sure that surgeons elsewhere are also commonly overlooking this lesion.

The scarcity of medical literature dealing with this subject leads to the same conclusion. Aside from the splendid contributions of Dr. E. A. Codman, who has been the pioneer in this field and to whom we owe practically all that is known about lesions of the subacromial bursa and of the supraspinatus tendon, and to which I shall have many occasions to refer during the course of this article, I was able to find nothing of importance in a search going back as far as 1904. The first paper by Dr. Codman [1] referring to this subject appeared in that year. In successive articles, numbering ten in all, he [2] has dealt with all phases of the subject and has insisted on the essential unity of lesions of the subacromial bursa with those of the supraspinatus tendon. He has described the symptomatology of rupture of the tendon and has emphasized its common occurrence, but with singularly little response on the part of the medical profession. Many authors have written about lesions of the subacromial bursa, and an abundant literature is accumulating, but very few have recognized the importance of rupture of the supraspinatus tendon. My purpose in this paper is to discuss the etiology and pathology of this lesion, to describe the diagnostic signs and symptoms, and to report a method of operative repair which in my opinion offers a solution of certain difficulties encountered in attempting to bring about functional restoration of the shoulder.

ETIOLOGY AND PATHOLOGY

In order to understand the pathology and symptomatology of rupture of the supraspinatus tendon it is necessary to remember that the capsule of the shoulder joint in its superior and posterior portions blends with and becomes indistinguishable from the flat expanded tendons of the supraspinatus, infraspinatus and teres minor muscles as these pass to their points of insertion in the greater tuberosity of the humerus. These tendons themselves blend with one another and can be differentiated only in an arbitrary manner. The supraspinatus tendon lies superiorly and forms the roof of the shoulder joint. It forms also a part of the floor of the subacromial bursa, which is interposed between it and the acromion and extends outward nearly an inch between the greater tuberosity and the deltoid muscle. The function of the bursa is to facilitate movement of the greater tuberosity under the acromion in the motions of abduction and adduction of the shoulder.

Rupture of the supraspinatus tendon commonly takes place in close proximity to the greater tuberosity. The muscle then retracts, enlarging the gap and creating an opening of greater or lesser extent through which there is direct communication between the bursa and the shoulder joint. In addition to large ruptures of the complete type there are probably many small tears that involve only a few fibers of the tendon. Codman considers injuries of this type to be the most common cause of traumatic subdeltoid bursitis. Codman and Wright studied the pathology of the calcified deposits so frequently found in the supraspinatus tendon and came to the conclusion that they resulted from slight injuries of the tendon with an abortive attempt at repair in a tissue possessing but little blood supply. Brickner [3] and Moschowitz [4] arrived at a similar opinion. According to Codman, the term "calcified deposits" should be applied to these lesions in order to differentiate them from rupture of the tendon, which represents a different clinical entity and is far more incapacitating.

The cases of rupture of the supraspinatus tendon that form the basis of this paper were all of the complete type, and I shall confine my discussion to this group of lesions. The largest gap that was found at operation was about 2½ inches in diameter and extended posteriorly through the supraspinatus and infraspinatus as well as anteriorly into the subscapularis tendon. The intracapsular portion of the long tendon of the biceps was widely exposed. The smallest rent in the tendon that was disclosed at operation was 1 inch in diameter. The most common finding was a gap of approximately 1½ inches in diameter. In addition to the actual rupture, degenerative lesions were commonly noted in the intact portions of the supraspinatus and infraspinatus tendons. These for the most part consisted in fibrillation of the tendon and shredding with the formation of irregular tabs of tissue, sometimes calcified. All these injuries had existed for some months prior to operation, and the margins of the rent had been smoothed off by the formation of fibrous tissue, frequently with the development of a falciform edge. The articular cartilage covering the head of the humerus as it appeared through the gap occasionally exhibited fibrillation but for the most part was normal. As a rule no tissue or very little tissue remained attached to the greater tuberosity, and in several cases it was absolutely bare.

These degenerative changes were most marked in the patients in whom the longest time had elapsed since injury, so that much of it may be ascribed to wear and tear in a damaged joint and hence secondary in character. Nevertheless, I have observed similar though less marked changes in the tendon on opening the bursa for the removal of calcified deposits when no demonstrable gap existed. One cannot avoid forming the opinion that these are signs of gradual deterioration

* Read before the Section on Orthopedic Surgery at the Eighty-First Annual Session of the American Medical Association, Detroit, June 25, 1930.

* Owing to lack of space, this article is abbreviated here by the omission of several illustrations. The complete article appears in the author's reprints.

1. Codman, E. A.: Boston M. & S. J. **150**: 371 (April 7) 1904.
2. Codman, E. A.: Boston M. & S. J. **154**: 613 (May 31) 1906; **159**: 533 (Oct. 22), 576 (Oct. 29), 615 (Nov. 5), 677 (Nov. 19), 723 (Nov. 26) 1908; **164**: 708 (May 18) 1911; **165**: 115 (July 20) 1911; **196**: 381 (March 10) 1927; Industrial Doctor **4**: 121 (Aug.) 1926.
3. Brickner, W. M.: Am. J. M. Sc. **149**: 351 (March) 1915; Am. J. Surg. **30**: 108 (April) 1916.
4. Moschowitz, Eli: Am. J. M. Sc. **150**: 115 (July) 1915.

of the tendon from excessive use and advancing age, with perhaps defective circulation in the background. These changes probably precede and pave the way for rupture of the tendon, and this view explains why, in many instances, rupture finally occurs under conditions that approximate normal use.

Such changes are of common occurrence and have been noted by other observers. A. W. Meyer [5] has described many examples of attrition in the human body affecting particularly bursae, tendons and ligaments. Most of his investigations have been made in dissecting room subjects. He found many instances of fraying and rupture of the long tendon of the biceps in the shoulder and also referred to destruction of the superior half of the shoulder joint capsule which he had encountered in several cadavers. He said that in such instances the deltoid muscle served as the joint capsule. These must have been cases of rupture of the supraspinatus tendon.

Dr. Codman, for years, has made a practice of opening the subacromial bursa and examining the supraspinatus tendon in the shoulders of cadavers used for

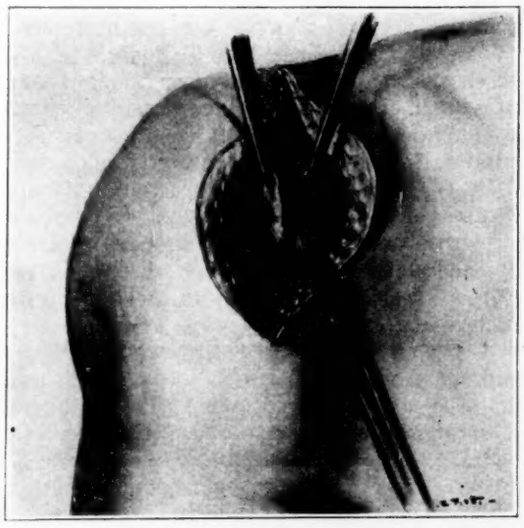

Fig. 2.—First step: exploration of the bursa through small muscle splitting incision to determine nature of the lesion. Small ruptures of the tendon may be repaired through this incision.

anatomic instruction at the Harvard Medical School. He stated that never in a set of twenty cadavers had he failed to find at least one instance of rupture.

During the last year Dr. I. B. Ackerson, working in collaboration with Dr. Codman, has made a careful pathologic study of 100 shoulders in 52 autopsy subjects. Through the courtesy of the authors I have been privileged to study their observations, which are as yet unpublished but will soon appear. Rupture of the supraspinatus tendon was found in 39 per cent of the specimens, and in twenty-one it was of sufficient size to expose the head of the humerus to view.

Codman has operated on more than fifty patients in whom he found rupture of the tendon. He has found it to be the most common cause of prolonged shoulder disability among patients with industrial injuries.

All these observations point to the common occurrence of this lesion which my own observations confirm. The lesion is rarely recognized, and one must conclude that it is frequently overlooked.

5. Meyer, A. W.: Unrecognized Occupational Destruction of the Tendon of the Long Head of the Biceps Brachii, Arch. Surg. **2**: 130 (Jan.) 1921; Am. J. Anat. **34**: 241 (Sept.) 1924.

CAUSATION

Rupture of the supraspinatus tendon is commonly a lesion of late adult life and occurs most frequently in individuals who have done active or laborious work. The youngest of my patients was 35, four were in the fourth decade, four in the fifth, and one in the sixth. Four were laborers, two machinists, one a shoe worker, one a police officer, one a stationary engineer, and one a folder of woolen cloth.

Rupture is generally produced in one of two ways, either by muscular strain when the shoulder is being lifted in abduction, or by a direct blow on the shoulder, usually from a fall with or without accompanying dislocation. There were three examples of muscular violence in the group studied. One patient was attempting to toss a stone upward out of a trench, when he felt a painful snap in the shoulder. One was engaged in folding heavy woolen cloth, a task necessitating abduction and external rotation of the right shoulder at the moment when the rupture occurred. It is of interest to note that he had performed this same task many times daily during a period of six years. A third patient was pulling on a chain hoist when his hand slipped off. He made a sudden effort to stop the descent of the arm and recover balance, and as he did this the tendon ruptured.

In sharp contradistinction to this type of muscular violence is that in which the patient receives a blow or sustains a fall on the point of the shoulder. Six of the patients studied had received their injury in this manner. One fell while intoxicated and dislocated his shoulder anteriorly, the dislocation being reduced at one of the local hospitals. A second patient gave a history of having fallen on his shoulder while his arm was twisted behind him. In the other three patients no history could be obtained except of direct trauma to the shoulder. One may consider two possible explanations for the injury. Either in falling the patient suddenly abducted his arm from the side in order to break the fall, the rupture occurring during this movement before the shoulder struck the ground; or the fall or blow was received on the back of the shoulder with the production of a momentary forward displacement of the head of the humerus during which the tendon ruptured, followed by immediate spontaneous replacement of the head, so that no demonstrable dislocation resulted. Certainly anterior dislocation of the shoulder is capable of causing rupture of the supraspinatus tendon. Dr. Codman has found it a frequent complication of this injury. Of the patients on whom I have operated, the most extensive rupture was found in the one who had sustained a dislocation.

In one of the patients studied, in whom a rupture was found at operation, no history of injury could be elicited even with repeated questioning. He had noticed gradually increasing pain in the shoulder for three days, and this had been followed by a sudden severe pain, after which there had been complete disability. One cannot explain the occurrence of this rupture without supposing that the tendon had been gradually weakened by some pathologic process, and yet at operation no evidence of any such process was found beyond the usual signs of degeneration.

DIAGNOSIS

An astonishing fact about rupture of the supraspinatus tendon is the small amount of pain associated with the tear. Three of the patients who had sustained rupture from muscular violence noticed momentary

sharp pain but continued with their work. They noticed weakness of the arm and inability to abduct but were able to avoid this movement and continue with their jobs. One stopped work the following day; the second, three days after injury. All three of these patients underwent operation, and in all of them large ruptures of the tendon were found.

The patients who had sustained direct violence on the shoulder complained at first of pain, increased by movement. This was regarded as a normal effect of a severe contusion, and it was only when improvement failed to occur after prolonged treatment with physical agents that further investigation was made, leading finally to a correct diagnosis.

Careful investigation of the history is of great help in making the diagnosis. The story of a painful snap in the shoulder followed by noticeable weakness, even though the patient was able to work, should immediately suggest the possibility of rupture of the supraspinatus tendon. Continued shoulder disability following a fall on the shoulder or failure to regain normal function quickly following a dislocation should also be considered as likely indications. In fact, any disability of the shoulder that has had a sudden onset should be regarded with suspicion.

Examination of the shoulder shows atrophy of all the muscles, but most marked in the supraspinatus and infraspinatus regions. This is assuming that the patient has been injured four weeks or more previously, and I may interpolate here that one never sees these patients earlier. Palpation usually reveals a point of sharply localized tenderness over the tip of the greater tuberosity of the humerus, or just medial to it under the acromion. This may disappear when the tuberosity passes under the acromion (Dawbarn's sign). As the

Fig. 5.—Complete rupture of the supraspinatus tendon with tear of the transverse intertubercular ligament uncovering the upper portion of the long tendon of the biceps. The drawing was made from one of Dr. Akerson's specimens.

shoulder is moved actively through its range of motion, there is noted a coarse crepitation in the region of the bursa, or what Codman describes as a jog or catch, when the tuberosity passes inward under the acromion. As the shoulder is moved forward and backward, or passively in rotation, an unusual bony prominence can be felt to move under the examiner's fingers in the region of the bursa. This is the greater tuberosity, which stands out more prominently because of the gap in the tendon at its inner side.

Tests of motion show results that vary considerably. The most common finding is lack of active abduction or weakness in this motion. The supraspinatus muscle

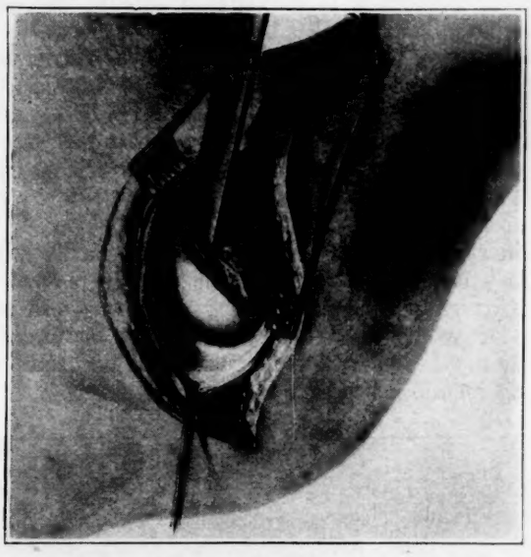

Fig. 6.—Repair of the tendon, first step. The edges of the gap are trimmed and a bone channel is cut in the anatomic neck at the proximal edge of the greater tuberosity.

assists the deltoid muscle in abducting the shoulder when the arm is at the side. In this position the fibers of the deltoid run in a vertical direction, and contraction of this muscle without other assistance would lift the humerus upward and jam the head against the acromion without producing abduction. Contraction of the supraspinatus pulls the greater tuberosity in under the acromion and abducts the shoulder through the first 15 to 20 degrees to the point where the deltoid can take hold and complete the movement. The supraspinatus also has the function in conjunction with the other adjacent short muscles of pulling the head inward and fixing it in the glenoid, and thus stabilizing it during any movement.

Theoretically, rupture of the supraspinatus ought to take away the ability to abduct the arm from the side but ought not to interfere with the power of sustaining the arm in right angle abduction if the shoulder is passively placed in that position. This test is often positive in patients with complete rupture of the supraspinatus tendon; but when, as often happens, the tear is small, sufficient tendinous tissue is left intact to transmit a pull to the greater tuberosity, and then the ability to initiate abduction remains. This movement, however, is weak, and the weakness is demonstrated by resistance tests and by careful observation of the scapula during abduction when, in comparison with the normal shoulder, a different rhythm of motion can be seen. Furthermore, patients with a rupture of long duration learn certain tricks of using the other muscles to compensate for their weakness, and this may prove confusing. I have seen a patient in whom a complete tear in the tendon was later demonstrated who was able to abduct the arm through a nearly normal range. Weakness was evident, however.

Another factor that often causes confusion is limitation of shoulder motion. This may be due either to

adhesions that form in the bursa and about the capsule as a result of the organization of the traumatic exudate or to muscle spasm protecting and guarding against a movement that would occasion pain. Usually the movements most restricted are abduction and rotation; hence it may be impossible to demonstrate a difference in the range of active and passive abduction that might be of diagnostic significance.

When there is a free range of motion the patient will usually be able to lift the arm in the forward plane of the body to a point above his head but will be unable to do this in the lateral plane. When the arm is lifted passively into right angle abduction the patient can hold it there with his own muscles, but when he lowers the arm to the side a point is reached at which he can no longer support it and the arm suddenly drops to the side.

Pain on motion of the shoulder is usually present but may be absent. The pain is usually produced by active or passive movements of abduction and at the point at which the tuberosity passes in under the acromion. It is often felt at the moment when the jog mentioned before occurs.

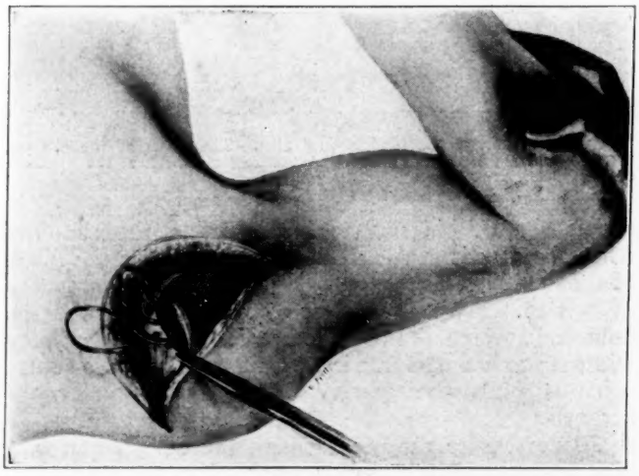

Fig. 8.—Repair of the tendon, third step. With the shoulder abducted, the tendon is approximated to the greater tuberosity and laced into the channel with fascia lata or silk.

Roentgenologic examination of the shoulder is of considerable value as an aid to diagnosis, particularly in the long standing cases. Stereoscopic views should be made of the disabled shoulder, and the examination should include the normal shoulder for purposes of comparison. The roentgenograms frequently reveal several irregular areas of calcification in the tendon which are different in appearance from the common calcified deposits. In other cases there is noted a rounding off of the tip of the greater tuberosity with a widening of the sulcus between it and the head which is fairly characteristic. This is caused by atrophy of the bone at the point of attachment of the tendon.

OPERATIVE TREATMENT

The treatment of rupture of the supraspinatus tendon is operative unless the tear is so small as to disturb function but slightly, or unless the general condition of the patient is such as to contraindicate it. It is to be admitted that an individual may be able to get along without the power to abduct the shoulder, but not if he is an unskilled worker nor if he is suffering pain of the type many of my patients have described. Nor should the surgeon passively permit a patient to remain content with a physical handicap that can generally be removed with such little risk.

The ruptured tendon can be repaired, but certain technical difficulties must be overcome in order to obtain serviceable function. These difficulties are encountered only in the patients with complete tears and large gaps. Some of these rents are enormous, and no one can really appreciate what the problem is who has not personally seen them and attempted their repair. It is possible to approximate the retracted tendon to the greater tuberosity only by abducting the shoulder and pulling the tendon outward under considerable tension. Furthermore, the tuberosity is usually bare of tissue, and a firm point of attachment can be secured only by drilling holes in the bone. In order to provide the opportunity for the development of a real bony attachment, it is necessary to assure a broad contact between the flat sheet of tendon and a raw bony surface. With all this it is necessary to reconstruct a smooth floor for the new bursa and not leave irregulariites that might interfere with movement of the tuberosity under the acromion and cause pain.

Codman has commented on these difficulties and stated that it was often difficult to obtain perfect results. He employed heavy silk to fix the tendon to the tuberosity, and in some instances did what he described as a suture "à distance." He accepted Lange's idea that tendon tissue would grow out along the threads and form a bridge to the greater tuberosity. It seems to me doubtful whether one can ever obtain a full restoration of function by this method.

In my earlier cases I employed fascia lata instead of silk, feeling that it was as strong as silk and far more permanent because it becomes completely incorporated in the tissue. At first I contented myself with drilling two holes in the tuberosity, permitting a mattress suture with the two ends quilted in the tendon and tied with the parts approximated. This, although it gave good results in the first three patients, was not wholly satisfactory to me as there seemed to be little opportunity for the tendon to secure bony attachment except at the two points of fascial fixation. I then studied the problem on the cadaver and worked out the technic I have used in my last four cases.

A wide exposure of the tendon is necessary, and for this I am sure there is no better approach than Codman's "saber cut" incision crossing over the outer end of the shoulder girdle. Before proceeding with this, however, it is well to explore the bursa and determine the extent of the lesion. One therefore begins with an incision about 2 inches long extending downward from the acromioclavicular joint, and splitting the fibers of the deltoid. One cannot extend it farther downward without danger of dividing the anterior portion of the circumflex nerve and paralyzing the inner fibers of the deltoid. The bursal cavity is entered, and with proper retraction and a downward pull on the arm one can see well up under the acromion. By rotating the arm, the greater and lesser tuberosities with their attached tendons can be brought into view. If a rupture is present, it can be clearly seen as a gap in the capsule through which the articular cartilage covering the head of the humerus appears.

If the rent is small, it may be repaired through this incision. One can reach up under the acromion with forceps, pull the tendon down and fix it to the greater tuberosity. Codman has told me that he has more or less given up the use of his saber cut incision in preference for this method and that he employs special small

stout curved needles with which he can pass sutures through the tendon. I repaired the tendon in one of my patients by this method, but I was not satisfied with the mechanics of this procedure, and the progress of this patient has on the whole been less rapid than that of the other patients in whom I have employed the more radical procedure I am now using. When the gap is large enough to require abduction of the shoulder to approximate the tendon, the saber cut incision must be used.

This incision passes posteriorly over the top of the shoulder from the acromioclavicular joint. The articulation is divided with a knife and the base of the acromion is cut through with a sharp osteotome or Gigli saw. The outer flap which includes the tip of the arch of the shoulder girdle and the attached deltoid is retracted outward. This gives a wide exposure of the capsule and tendons overlying the humeral head, and the extent of the gap resulting from the rupture can be fully appreciated.

The healed fibrous edge of the opening is excised generously enough to expose sound tendon tissue. By seizing the edge of the tendon with forceps and pulling down strongly while at the same time abducting the shoulder, one can approximate it without undue tension to the greater tuberosity. With a sharp osteotome a channel is cut transversely in the anatomic neck of the humerus and inner face of the greater tuberosity to provide a bed for the edge of the tendon. This channel is about one-fourth inch in width and from three-fourths to 1½ inches in length, depending on the extent of the rupture. Using a three-sixteenths inch drill, holes are now drilled through the lateral surface of the humerus below the greater tuberosity into this channel. From four to seven holes are required and they are spaced about one-fourth inch apart.

For suture material I have employed fascia lata, which I obtain with a special fascial stripper fitted with a guillotine blade which operates through a small incision in the lateral surface of the thigh just above the knee. As the tendon, however, with this technic, should ultimately obtain a bony attachment, there is less advantage in the use of fascia lata and I see no great objection in substituting silk. The fascia is threaded in a fascial needle and one end of the suture is passed through the edge of the torn tendon at the anterior margin of the rupture and anchored, following Gallie's technic. The needle is then passed outward through the first drill hole and inward through the second. It again passes through the edge of the tendon, then outward through the same drill hole, and inward through the next to obtain again a grip on the tendon (fig. 8). The process is continued until all of the drill holes have been used, when the end of the suture is pulled taut and fixed to itself according to Gallie's technic. At the conclusion of the suture the freshened edge of the tendon has been drawn down into the bony channel and there is a row of fascial lacings at the outer side of the humerus well below the tip of the greater tuberosity and out of the way of possible contact with the acromion. This leaves a smooth bursal floor and at the same time provides means for the tendon to become fixed to the bone throughout the length of the channel. When the tear extends backward into the infraspinatus, the edges of this portion of the tear are freshened and approximated with a continuous fascial suture.

The wound is carefully closed in layers. The outer flap, which has been retracted, is lifted up and approximated to the inner one. I have usually drilled the outer surface of the clavicle and the inner surface of the acromion and fixed them with number 2 chromic catgut. The parts fit back into place quite normally, and this suture, together with a careful suture of the overlying fascia, yields a firm approximation without any tendency to displacement. I have never found it necessary to suture the divided fragments at the base of the acromion. The healing of the shoulder girdle has always proceeded normally, and I have never seen any untoward results from its division.

I have always considered it necessary to fix the shoulder in a position of 90 degrees abduction. The tension on the suture line would otherwise be dangerous. Furthermore, I believe that recovery of function in the atrophied muscles will be obtained more rapidly if they are kept relaxed. I have applied a light wire platform splint for this purpose. Complete fixation has been maintained, usually for three weeks. At the end of this time the splint has been removed daily for massage and exercise treatment. At the end of four weeks the splint has been discontinued altogether. At first there has been a good deal of shoulder stiffness,

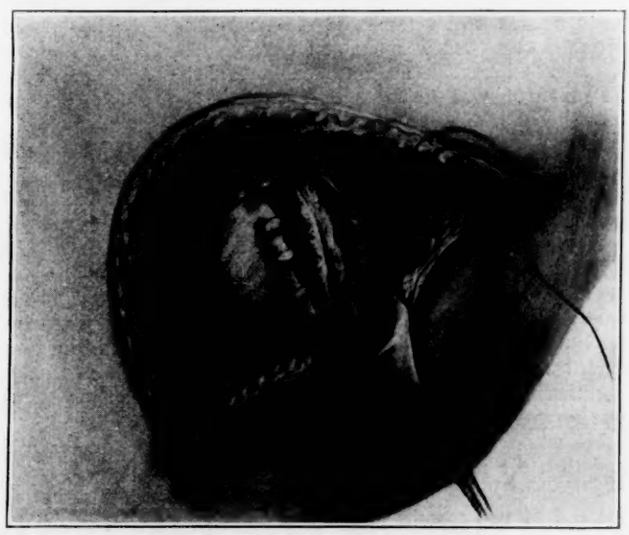

Fig. 9.—Repair of the tendon completed. The drawing shows an area of raw bone exposed which should not be present. In actual practice, the edge of the tendon fills the channel and leaves a smooth surface above.

but with continued massage and exercise this has diminished, and at the end of three months there has been a fair return of function. One of my patients returned to work at the end of four months, one at the end of six months, and one at the end of eight months. One returned to his original occupation, and two have obtained different employment of a lighter character. One patient, who was operated on more than four months ago, has practically normal motion and power and has returned to his old job as a machinist. All can abduct the arm at the shoulder to above the head, and none complain of pain, although two state that their arms are less strong than formerly. One patient has not yet returned to work at the end of fifteen months, although he has practically normal function. He is an elderly man who did heavy labor and was approaching the end of his active working days when he was injured. He is an industrial compensation case who has always shown extreme timidity but has an earning capacity if he can find lighter work. Another patient was operated on eight months ago and has not gone back to work. He had the smallest rupture

of the entire group, and it was repaired through a small incision in the deltoid. He has active and free abduction but complains of pain. He may have an irregularity in the bursal floor that gets pinched under the acromion.

One patient reruptured his tendon and required a second operation. This case is of interest and indicates the value of the method of suturing the tendon that I have described.

REPORT OF CASE

A man, aged 47, a laborer, admitted to the Massachusetts General Hospital in September, 1929, complained of lack of strength in his arm. He gave a history of having fallen while intoxicated four months previously, dislocating the left shoulder. He was taken to a local hospital, where the dislocation was reduced, and he remained four weeks. During this time he had severe pain in the shoulder and was unable to use the arm. The pain had diminished, but the strength had not improved.

Examination showed marked atrophy of the spinatus muscles. There was a normal range of passive motion in the shoulder, but on abduction there was noted a definite jog or catch under the acromion. Active flexion and extension of the shoulder were nearly normal, and he was able by making a great effort to abduct the shoulder and lift the arm above his head. The power was weak, however, and after making this movement twice he was unable to lift the arm again until he had rested several hours. He was totally unable voluntarily to rotate the shoulder externally, although this could be done passively. Palpation showed no tenderness, but the tip of the greater tuberosity was unusually prominent.

Roentgen examination showed marked atrophy of the head of the humerus with evidence of an old fracture of the greater tuberosity. Several irregular areas of calcification were noted in the line of the anatomic neck.

Operation was performed, September 28, by means of the Codman saber cut incision. A great gap was found in the capsule involving both the supraspinatus and the infraspinatus tendons and about 2½ inches in diameter. The supraspinatus tendon was pulled across to the greater tuberosity, which was quite bare and fixed with a mattress suture of fascia lata passing through two drill holes. The rent in the infraspinatus was repaired with the same material.

He was treated with the arm in abduction for one month, and then the platform splint was removed and exercise treatment started. At first he made satisfactory progress, but at the end of two months he came in complaining of pain in the shoulder, and I found the bursa fluctuant and containing fluid. His power of active abduction was gone, and I recognized that the tendon had again ruptured. It later developed that this had occurred when the patient was intoxicated.

After five months I finally prevailed on this patient to submit to a second operation, which was performed, March 8, 1930. I found the mattress stitch had ruptured and that the original gap had reopened to its entirety. The presence of extensive adhesions made the prospect of functional restoration anything but bright. I sutured the tendon according to the improved method described, lacing the tendon through seven drill holes. Now, three months after operation, this patient has strong active abduction without pain and can raise his arm above his head. I believe he will eventually obtain a serviceable shoulder.

SUMMARY

An experience with ten patients with complete rupture of the supraspinatus tendon in a period of eighteen months has impressed me with the frequent occurrence of this injury. The pathologic observations at operation indicate gradual weakening of the tendon previous to rupture. The lesion should be suspected in any patient who gives a history of shoulder disability of sudden onset and particularly when a painful snap has occurred during a movement of abduction or when there has been a fall on the shoulder with or without dislocation. The characteristic sign of rupture is inability to abduct actively while this movement may be executed passively. This sign may be masked by muscle spasm or adhesions. Repair of the tendon is rendered difficult by the extent of the gap in the capsule and it is important not only to suture the tendon to the greater tuberosity but to provide a means whereby it may develop a real bony attachment throughout its breadth. The results of operation show that the disability can be removed and emphasize the importance of recognizing this lesion, which at present is frequently being overlooked.

372 Marlborough Street.

ABSTRACT OF DISCUSSION

DR. HENRY MARBLE, Boston: Injury to the roof of the shoulder joint is common. It happens in workmen and is to a considerable degree a disabling injury. It must not be believed that the only motion of the shoulder joint that there is is that of abduction. Forward elevation is infinitely more important, and the motion of abduction is not as important in the working of the shoulder joint as most people believe. The most important part of the paper is that Dr. Wilson brought out the necessity of early diagnosis. Dr. Codman has pointed out repeatedly that with the arm drawn backward and with the finger pressed down directly outside the acromion and a bit forward, and by bringing the arm forward and then backward in a normal joint, it is a smooth surface; but if the roof of the shoulder joint is torn the nubble end of the supraspinatus tendon, which is attached to the tuberosity, sticks up and with the finger pressed down in that position one can feel it slip under the finger, and it gives a distinct—he calls it a palisade—hummock as it goes by. He then believes that, when the patient is turned about and made to practice abduction, if the motion of complete abduction is lacking in rhythm, if, as the arm goes into abduction, this nubble, ruptured supraspinatus, impinges on the acromion, the scapulothoracic motion begins earlier than on the normal side and exploration is justified. Certainly exploration is a simple performance and until a physician has performed hundreds of early explorations he cannot hope for great success. All of Dr. Wilson's cases have been old cases. All of Dr. Codman's cases have been old cases. The results are the same that one would receive in joint operations following old injuries; therefore, one must explore and explore early. The exploration can be done under procaine hydrochloride and a view can be obtained of the roof of the shoulder joint through the subdeltoid bursa and then, if it is found that the shoulder joint roof is ruptured, the supraspinatus is drawn back and it can then be sutured. If, on the other hand, there is no difficulty there, the only thing that has happened is that the subdeltoid bursa has been opened and little or no harm has been done. So, my plea is that exploration be done in injuries to the shoulder joint in which there is a jog on forward elevation and a lack of rhythm when the patient raises the arms in abduction. If it is done, I believe that the results will be infinitely better.

DR. ROBERT D. SCHROCK, Omaha: Dr. Wilson has made a little less indefinite a field about the shoulder joint which has been and still is, in spite of his splendid explanation, indefinite: that group of conditions classified as "painful and disabling shoulder." There are at present two fairly definite features: the demonstrable bursitis and the rupture of the supraspinatus tendon.

DR. A. BRUCE GILL, Philadelphia: When I began the study of orthopedic surgery some years ago, these conditions about the shoulder joint which arise from acute or chronic strain were diagnosed generally as periarthritis of the shoulder. This term was indefinite and unsatisfactory but I was not able at that time to make any clear differentiation of these various conditions. However, as I began to note various points of tenderness about the shoulder joint I began to change my diagnoses to various types of bursitis. There is a well known point of tenderness just below the acromion which is probably due to a subdeltoid bursa. There is the point of tenderness that Dr. Wilson has called attention to over the roof of the shoulder joint. A third and common tender spot is to be found just

below the spine of the scapula and over the posterior aspect of the head of the humerus. This I believe to be due to a bursa beneath the infraspinatus tendon. A fourth common point of tenderness is over the coracoid process, particularly on its anterior and lower aspect. It seems probable that this is associated in some way with the muscles which are attached to the coracoid. I am impressed by the fact that the rupture of the supraspinatus tendon occurs much more commonly than was supposed to be the case. It may be possible that the symptoms referable to the infraspinatus tendon may also have an evident surgical cause such as Dr. Wilson has demonstrated in respect to the supraspinatus. I think his work is an important step forward in the knowledge of these common and disabling conditions about the shoulder joint.

DR. JOHN H. RISHMILLER, Minneapolis: The simplest motion of an extremity cannot be accomplished by any single muscle but is brought about by the help of several muscles, and in such a complicated mechanism as the shoulder joint even comparatively simple motions require the use of many muscles. For instance, when one does a hammer-striking motion, one employs twenty-three muscles. The supraspinatus muscle abducts through a limited arc, say, of about 15 degrees. In paralysis of the deltoid from poliomyelitis or from trauma to the circumflex nerve, slight abduction still remains; nevertheless, the deltoid is the great abductor muscle. Its function is brought to an end when the arm has been abducted to the horizontal plane. Abduction above this point, carrying the arm to the vertical position, is brought about by the serratus anterior and the trapezius. The serratus anterior moves the scapula so that the spine of the scapula is kept parallel to the humerus. It is hardly conceivable how one muscle can be injured without injuring the neighboring muscles; moreover, the function of the muscles uninjured is also greatly disturbed. Some twenty years ago, strenuous surgical effort was made to improvise methods by which the acromioclavicular ligaments could be reconstructed following rupture, so as not to have any permanent disability. This resulted in failure at that time. From this and from succeeding experiences, the impression has been gained that repairs of the acromioclavicular ligaments are prone to result in some disability and would mean the disqualification of an applicant for certain occupations. At that time I went through the phase of using silk, chromic catgut, kangaroo tendon, fascia lata and silver wire. They were all abandoned. I think that Dr. Henderson may contribute something with the use of the peroneus longus tendon. There are three points that should be mainly brought out if success is to be obtained: 1. The flap of the deltoid should be made as long as possible, including periosteum, so that there will be no difficulty in firm attachment by sutures to the front of the shoulder joint. 2. The end of the deltoid flap should be sutured in front to the tendon of the subscapularis and next should be sutured to the separated fibers of the deltoid. 3. The partially severed pectoralis major, teres major and latissimus dorsi should not be sutured so as to have a freer quadrilateral space for the transplanted flap of the deltoid.

DR. PHILIP D. WILSON, Boston: The only thing I wish to emphasize is the fact that this is a common lesion. Most physicians have seen these lesions and, like myself, have failed to recognize them. The problem is a difficult one. What has to be done is to make the man who sees these cases first recognize them. It would be far easier, of course, to repair all of these injured tendons if the patients could be seen within twenty-four or forty-eight hours instead of in three or four months after the injury. Many secondary changes have then set in which make less perfect the recovery of function. I divide the acromioclavicular joint and go back just as if a saber came down on the top of the shoulder, divide the joint and go through the base, and this flap is retracted outward with the deltoid, which gives a broad exposure of the whole top of the humerus covered by its tendons, and with the gap. It is possible to repair small ruptures through the small muscle. The recovery of function is rather slow at first. The shoulder seems pretty stiff and one wonders whether the muscles will loosen up, but at the end of from eight to ten weeks one begins to see a definite gain and at the end of twelve weeks a fair range of motion, and after that it comes along all right.

Clinical Notes, Suggestions and New Instruments

A NEW ELECTROCARDIOGRAPH *

ANDREW P. D'ZMURA, M.D.
PITTSBURGH

In 1926, the late Mr. Joseph W. Legg, research engineer of a large industrial company,[1] conceived the idea of applying the oscillograph, an instrument of precision used for many purposes in electrical engineering, to clinical medicine.

Through the courtesy of Dr. T. Lyle Hazlett, medical director of the company, the opportunity was given to me to consult

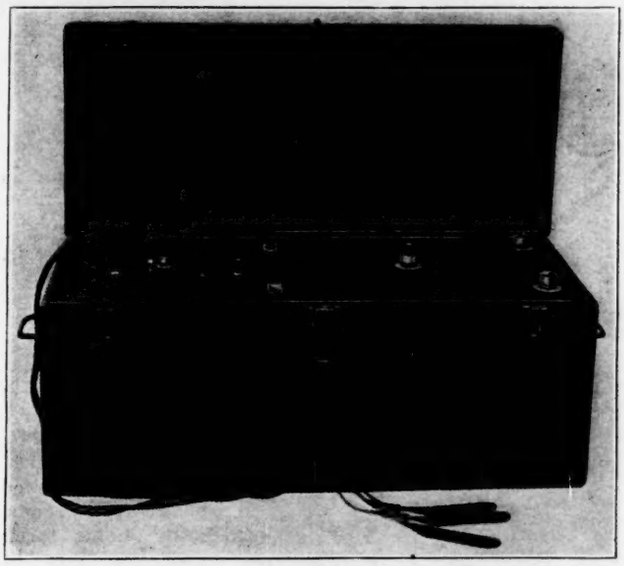

Fig. 1.—New self-contained portable electrocardiograph.

with Mr. Legg, and it was decided that the first application of his device would be to electrocardiography.

The untimely death of Mr. Legg made it necessary for his associates Mr. Clare Anderson, Mr. H. T. Rights and Mr. R. H. Lewis to solve the technical details involved in adapting the oscillograph to a different range of sensitivity, conforming to the accepted standards used in electrocardiography.

The outcome of this work has been a new electrocardiograph. It is a self-contained apparatus, weighing considerably less than any other cardiograph now available. This complete unit includes an amplifier with batteries to step up the heart voltage, a light source and galvanometer which deflects a light beam

Fig. 2.—Tracings of patient with complete heart block: Upper tracing, standardization with patient not in circuit; note sharpness of rise and fall. Lower tracing, standardization with patient in circuit; note sharpness of rise and fall. In all the tracings, time lines indicate one twenty-fifth second.

to record the impulses, a camera which receives the record, a spring motor which drives the film, and a timing device that marks it and determines the correct speed of the film.

The amplifier requires no compensation for body resistance or skin currents, thus allowing standardization to be made with

* From the Department of Medicine, the University of Pittsburgh School of Medicine.

1. The Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

the patient in or out of the circuit. The batteries supplying the power need be replaced only at long intervals, and the tubes have a life equal to that of the best radio devices.

The galvanometer is of sturdy construction and is adjusted to give no overshooting. The combined effects of galvanometer and amplifier have been carefully calculated so that there will be no distortion of the impulses. The wave is correct for phase

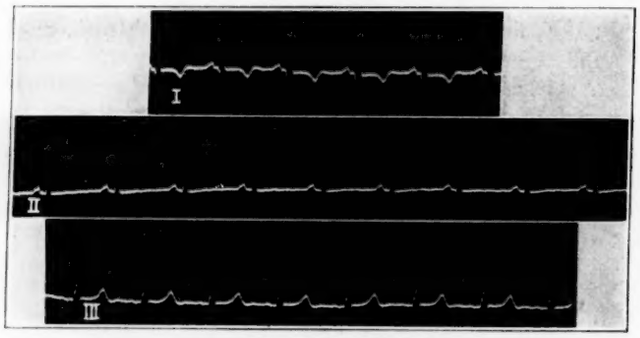

Fig. 3.—Tracings taken from a patient recovering from coronary occlusion.

relations up to the seventy-fifth harmonic, and the amplitude can be relied on for values discernible on the film.

The camera is arranged to receive standard 100 foot rolls of moving picture film that may or may not be daylight loading, as desired. Another feature is that additional pictures may be taken at any time, without the complication of rerolling.

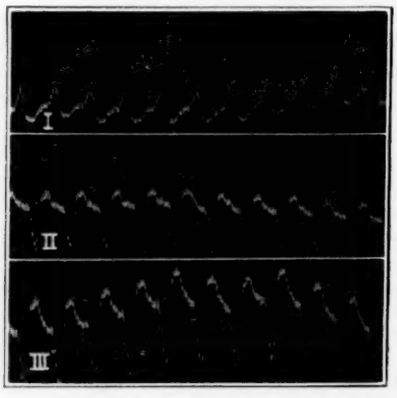

Fig. 4.—Tracing in arrhythmia following coronary occlusion; ventricular tachycardia; rate, 192. This was taken in the patient's home, which had old fashioned wiring. The switch was not turned down. Note the alternating current ripple, which does not, however, distort the essential features of the curve.

A time marker, operating independently of the spring motor, has been installed to give lines one twenty-fifth second apart, so that accuracy of time relationship is assured.

The control board has been reduced to the simplest possible arrangement, making it unnecessary to go through complex adjustments to obtain satisfactory tracings.

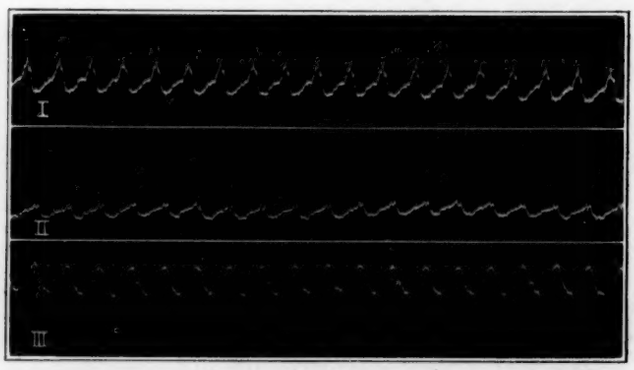

Fig. 5.—Tracing in arrhythmia following coronary occlusion; ventricular tachycardia; rate, 192. This tracing, a day later than the previous one, was taken in the patient's home, which had old fashioned wiring. The switch was turned down. Note absence of alternating current ripple and change in lead II.

Many additional refinements, trivial but important for ease in operation, have been added.

The entire unit operates independently of supply lines. There is no wet battery; consequently there will be no deterioration due to corrosive effects of acid fumes. All parts are self-contained; there is nothing to forget or to lose.

Rigid clinical tests have been made with exceedingly satisfactory results. The proximity of elevators, x-ray machines and other electrical appliances has not interfered with the operation of the new apparatus, as induction and "weaving" are negligible.

Tracings were taken in the plant of the company, where the amount of "static" is enormous, as well as in various hospitals and homes, with the apparatus placed on the ordinary bedside stand or table, no special carrier being necessary.

It is believed that the new electrocardiograph possesses many advantages from the standpoint of technical accuracy, and its ease of operation will be evident on comparison with any other electrocardiograph now available.

Its first public demonstration took place, May 17, 1930, before the cardiac commission of the Allegheny County Medical Society in Pittsburgh.

It was exhibited at the Detroit session of the American Medical Association in June, 1930, and at the meeting of the Pennsylvania State Medical Society in October, 1930.

121 University Place.

A PRECISION MEATOME

LOWRAIN E. McCREA, M.D., PHILADELPHIA

The employment of a meatome is the most efficient as well as the simplest method of performing a meatotomy. Meatotomy is frequently necessary in many instances prior to intra-urethral examination or before treatment can be instituted. Because of its frequency and necessity in such cases, it should be done in a simple but accurate manner. The common method, in both office and operating room, depends on the use of a straight, blunt bistoury. Such a method may be satisfactory in the hands of the highly skilful operator but is never exact. Meatotomy often subjects the patient to considerable discomfort when the meatus is not opened as widely as necessary at the time of the original incision. Such a failure, in cutting the meatus insufficiently, makes it imperative to enlarge the opening by subsequent incision. At the other extreme, an incision that is too large will result in excessive bleeding. The principle involved is that an encased knife may be introduced through the meatus and an incision made as the instrument is withdrawn, the depth of the incision depending on mechanical adjustments of precision.

The enclosed blade type of meatome. *B* is blade protruding from its sheath in a position to incise the meatus as the instrument is withdrawn from the urethra; *A* is a lever which, when depressed, causes knife *B* to emerge from sheath; *D* is a threaded screw toggle by means of which the knife blade can be set at any desired point indicated on the instrument from 16 to 32 French scale of bougies.

The idea of this meatome is not original but was suggested by a contrivance manufactured some years ago by "Gemrig." However, the new instrument embodies several principles not incorporated in the old meatome. Compression of the handle grips as the instrument is withdrawn causes the knife-blade (*B* in the accompanying illustration) to be elevated out of its sheath to the desired depth of incision, as controlled by the thumb-screw (*D*) in the handle of the instrument. The knife sheath is tapered from 9 to 14 French, which permits its introduction into a small meatus. As the blade is worked on a fulcrum, length is essential to permit the many depths of incision desired. It is not necessary to introduce the instrument to the hilt of the sheath as the maximum width will be found at the tip of the knife blade. Any desired width from 11 to 36 French may be obtained by the cutting edge of the knife. The tip of the blade is blunted so that, in case of a false move, there is no danger of penetration of the urethral wall. On the side of the instrument one of the figures, 16, 20, 24, 28 or 32 French, shows at a glance the width at which the indicator of the controlling screw has been set.

The advantages of the meatome are many in that, by a single incision made on withdrawal, the meatus is accurately incised to any diameter from size 11 to 36 French. The instrument is small and compact; it is simple in design and construction, facilitating cleansing and sterilization.

The simplicity of design and construction of the meatome, as manufactured for me by George P. Pilling & Son Company, Philadelphia, is clearly shown in the accompanying illustration.

1930 Chestnut Street.

A CASE OF CONGENITAL ABSENCE OF THE RIGHT LEG

F. J. BARKMAN, M.D., CALUMET, MICH.

The mother of this child, aged 22, was one of a family of six children, all of whom are living and well. She weighed 145 pounds (66 Kg.) and was strong, healthy and well nourished. Her past history was entirely negative. The father, aged 26, was a member of a family of five children, all of whom are living and well. He weighed 140 pounds (64 Kg.) and had always been well and strong. The Kahn (and Wassermann) reaction was normal in both parents.

The pregnancy was normal except for severe vomiting of pregnancy at the end of the third month. This was controlled by hospitalization, treatment with intravenous dextrose and with diet. The remaining days of the prenatal care were uneventful.

The mother went into labor about 4 a. m. Severe bleeding began and after examination a diagnosis of placenta praevia marginalis and breech presentation was made. Under chloroform anesthesia the cervix was dilated, the upper margin of the placenta was freed and pushed posteriorly, and the child was delivered by podalic extraction. The extraction was difficult because I could find only one foot and leg. After the buttocks were delivered, the child was found to have a congenital absence of the whole right leg (fig. 1). When the delivery was being completed, the left humerus was fractured, as seen in the roentgenogram (fig. 2).

The child was stillborn. A roentgenogram was made to show the unusual deformity of the pelvis.

The roentgenologist reported a congenital absence of the ischium, part of the ilium and part of the pubis. There was no attempt to form the acetabulum, on account of the absence of these bones. There was a fracture of the left humerus.

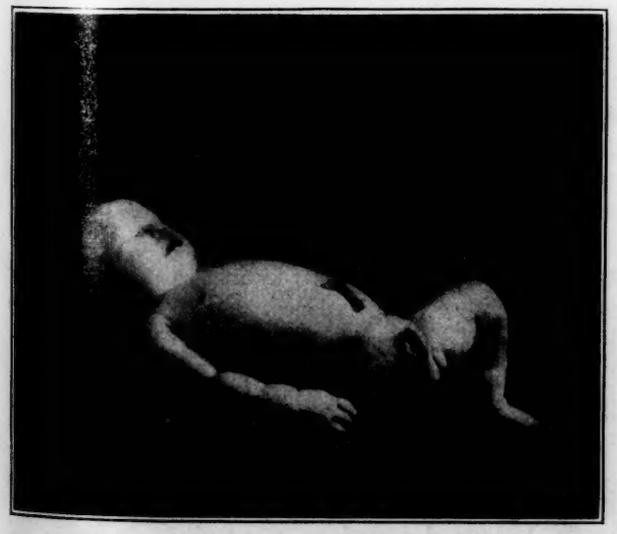

Fig. 1.—Appearance of child.

Autopsy was not performed, as permission could not be secured from the parents. The body was a full term, white female infant measuring 40 cm. long and weighing 6 pounds 13 ounces (3,090 Gm.). The head appeared normal. The pupils were equally dilated. The ears, nose and mouth appeared normal. Crepitus was felt in the left humerus. The chest and abdomen were perfectly normal. The lengths of the right and left arms were 15 cm. The left lower extremity measured 16 cm. from the tip of the toe to the upper portion of the inguinal canal. The right lower extremity was entirely absent. The skin was perfectly smooth over the whole right hip, there being no apparent attempt to form a lower extremity.

COMMENT

One of the most studied subjects in morphology has been the development of the vertebrate limbs. Critical summaries

Fig. 2.—Skeletal development.

have been given by Weidersheim (1892), Mollier (1893-1897), Gegenbaum (1898), Ruge (1902) and Braus (1904). No attempt will be made here to review this work except so far as it deals directly with the development of the human limb.

During the third week of embryonic life, the limb buds become filled with vascular mesenchyme. The source of this tissue is uncertain. In part it may come from the primitive body-segments, but it seems probable that in the main it comes from the parietal layer of the unsegmented mesoblast. Toward the end of the fourth week a slight condensation of the mesenchyme can be seen at the center of the arm buds and early in the fifth week a similar condensation may be noted in the leg buds. This condition represents the first rudiment of the skeleton of the limb. The tissue composing it may therefore be called scleroblastoma. From the scleroblastoma there is developed a membranous skeleton. In this a cartilaginous skeleton is differentiated and this in turn is replaced by the permanent osseous skeleton. Thus, three overlapping periods may be distinguished: a blastemal, a chondrogenous and an osteogenous.

In this case with the entire absence of the limb, and especially the failure even to form the acetabulum, the process must have stopped before the fifth week of embryonic life. There had been no apparent attempt of nature to provide the right limb, as shown in the roentgenograms.

After a search of the literature, only four similar cases have been found.[1]

129 Calumet Avenue.

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1. These cases are reported under the following articles:
Massart, R.: Congenital Absence of One Leg, Arch. franco-belges de chir. **27**: 205-210 (March) 1924.
Mouchet, A., and Roederer, C.: Ectromélie, Bull. Soc. de pédiat. de Paris **22**: 146-148, 1924.
Rabaud, E., and Hovelaeque, A.: Ectromélie longitudinale, intercalaire hemisiamentaire, Bull. biol. de France et de la Belgique **57**: 401-468, 1923.
Owen, W. B., and Pirtle, R. T.: Hemiectromelia: Case and Brief Review of Literature, Am. J. Surg. **36**: 207-275 (Nov.) 1922.

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SATURDAY, FEBRUARY 7, 1931

THE BACTERIOLOGY OF PERITONITIS

The bacteriologic study of peritonitis was the subject of a recent investigation by Meleney, Harvey and Jern,[1] with whom the surgeons at various clinics in New York cooperated. The investigation was preliminary to a study of the immunologic and serologic side of the question. The Columbia workers first investigated the intestinal organisms of man and the laboratory animals and those found in raw catgut, in order to develop a technic especially for anaerobic cultures. While studies on the bacteriology of peritonitis had been made previously, some methods used were either so simple or so elaborate as to fail to identify some of the anaerobic organisms present. Indeed, the present investigators do not claim that they recovered every species present, for there may have been organisms that would not grow on the mediums used. A bacteriologic study of the exudate was made in 106 cases of peritonitis taken at the time of operation on patients of the type that come to a general hospital. It is not surprising, therefore, that the great majority of the cases followed attacks of appendicitis.

The investigation indicates that peritonitis in a case in which the appendix has not perforated is not usually fatal, whether the appendix is gangrenous or simply inflamed. The exudate in such cases, if limited in extent, yields few organisms on culture or smear. If the appendix is perforated, the exudate is profuse, great numbers of various kinds of bacteria are present, and the disease is frequently fatal. Peritonitis, they found, was usually a polymicrobic disease. A single species of bacteria was found in only eleven of seventy-one cases that yielded a culture. Peritonitis is worse in every respect when more than one organism is present. The three bacterial species predominating in this series were nonhemolytic *Bacillus coli*, green streptococci and *Clostridium welchii*. In all, twenty-three different bacteriologic groups were recovered. Only one patient with a single infecting organism died and in that instance the organism was a hemolytic streptococcus.

When the exudate was due to a perforated lesion in the small intestine, severe symptoms developed promptly. Every case of perforated ileum in this series was fatal. Generally, in perforating lesions of the small intestine, organisms were not seen in the smears and the early cases even failed to yield growth. In the nonperforated lesions of the small intestine, bacteria were usually found on culture in the exudate, but not in great numbers, and the patients usually recovered. The majority of patients with perforated lesions of the large intestine recovered in spite of the fact that more bacteria were found in both the smear and the culture. Perforated lesions of the galibladder in this series were always fatal. There were no fatal cases of acute local peritonitis, while a third of the cases of acute diffuse peritonitis and a sixth of the cases of abscess were fatal. Whether there were from four to six different species of organisms in the exudate or only two or three, the percentage of mortality was almost identical. There were thirty-five cases in this group, three fourths of which were due to appendicitis that yielded no culture, but there were no cases of abscess which failed to yield a culture.

No patient less than 20 years of age died, but at 40 the mortality increased considerably with age. Bacteria were cultivated from the exudate in every fatal case. The mortality in the thirty-five cases that yielded no culture from the exudate was zero. The presence of *Clostridium welchii* and other spore-forming anaerobes, as well as the anaerobic streptococci and diphtheroid bacilli, does not appreciably increase the severity of the disease or the chance of a fatal outcome.

The authors believe their study shows that a comparison of the smear and culture from the exudate with the pathologic condition at the time of operation gives a sound basis for prognosis. The most important prophylactic treatment of peritonitis in their opinion is an early diagnosis and operation in cases of acute appendicitis. While this work lays the foundation for a future study in specific, prophylactic or active treatment for bacterial peritonitis by means of vaccines and serum, they are convinced now that any effort of that kind must take into consideration the symbiosis of the three commonest organisms found in the exudate of peritonitis; namely, *Bacillus coli*, the green streptococcus and *Clostridium welchii*.

It is interesting to note that in the same journal in which Meleney, Harvey and Jern reported their work, looking forward to a prophylactic study on peritonitis, Rankin and Bargen [2] reported a study on vaccination against peritonitis in surgery of the colon, which they say amply demonstrates that protection against lethal peritonitis can be established in animals by intraperitoneal vaccination. While their study

1. Meleney, F. L.; Harvey, H. D., and Jern, Helen Z.: Peritonitis: I. The Correlation of the Bacteriology of the Peritoneal Exudate and the Clinical Course of the Disease in One Hundred and Six Cases of Peritonitis, Arch. Surg. **22**: 1 (Jan.) 1931.

2. Rankin, F. W., and Bargen, J. A.: Vaccination Against Peritonitis in Surgery of the Colon: Further Report, Arch. Surg. **22**: 98 (Jan.) 1931.

suggests that the logical preventive reagent is a vaccine prepared from streptococci and colon bacilli, future experimental and chemical work should establish the best agent for this means of protection against peritonitis.

INFLUENCE OF PARATHYROID EXTRACT ON BONE SALTS

Among the phenomena resulting from the extirpation of the parathyroid glands, the decrease in concentration of the calcium in the blood is striking and characteristic. The decrease after parathyroidectomy may reach from 40 to 50 per cent. In young experimental animals, removal of the parathyroids results in the deposition of dentin, enamel and bone containing less calcium than occurs in similar tissue of control animals.[1] In a recent study, Speed and Rider[2] have reinvestigated the correlation between the decreased level of calcium in the blood and the healing of fractures after parathyroidectomy. Chemical examination of the fractures after three weeks revealed some callus formation but doubtful union, while after six weeks there was more or less firm union of the fractured bone. Firm bony union occurred in three weeks in the otherwise normal control animals. These observations were confirmed by roentgen examination. Histologic examination of the bone and callus further confirmed the definite delay in calcification in the experimental animals as compared with normal controls. There was much uncalcified callus and the trabeculae consisted of osteoid, poorly calcified, with connective tissue and fat between them.

Just as a lack of parathyroid function appears to exert an inhibiting effect on the rate of healing of fractures, evidence exists showing that, by administering the hormone of this gland, calcification and union are favored. In this case the striking feature of the result of injecting parathyroid extract is the marked increase in the concentration of calcium in the blood. The source of this calcium has been a subject of speculation and has stimulated considerable investigation. That a change in absorption from or excretion into the intestine is not the primary factor has been shown by Stewart and Percival,[3] who obtained the characteristic elevation in level of blood calcium after giving parathyroid hormone to experimental animals from which the intestine had been removed distal to the esophagus. New studies by Tsai and Hsu[4] have thrown further light on this question. If, as has been supposed, the added calcium and phosphorus arise from the bones, and if no other organs withdraw these elements from the blood during the period of augmented concentration under the influence of increased parathyroid hormone, the ratio of the increase of these elements in the blood should be the same as that in which they occur in the bone; namely, nearly 2:1. It was observed that, although the rise in phosphorus was slower than that of calcium and was maintained longer, the ratio of the absolute increase in the two substances at the maximum concentration in the blood after administration of parathyroid extract was approximately 2:1.

The experimental results of the Chinese investigators constitute cogent evidence that the origin of the augmented calcium concentration under the conditions imposed is in the bones. The difficulty of raising the blood calcium level by giving large doses of viosterol to parathyroidectomized animals and the failure to raise the concentration of calcium in the blood of animals deprived of vitamin D are additional suggestive observations relative to the origin of the increased calcium under the influence of parathyroid extract. These studies serve to emphasize a point of view brought out equally well by the study of the calcium balance during lactation; namely, that the bones are a readily available reservoir of mineral salts and that the exchange in these tissues is probably of surprisingly great magnitude.

1. Dragstedt, L. R.: Physiol. Rev. **7**: 499, 1927.
2. Speed, Kellogg; and Rider, D. L.: Experimental Healing of Bone After Parathyroidectomy, Arch. Surg. **21**: 679 (Oct.) 1930.
3. Stewart, C. P., and Percival, G. H.: Biochem. J. **21**: 301, 1927.
4. Tsai, C., and Hsu, F. Y.: Chinese J. Physiol. **4**: 265, 1930.

A YEAR'S PROGRESS IN ROENTGENOGRAPHY OF ABDOMINAL VISCERA

THE JOURNAL has frequently emphasized the manner in which years of patient investigation precede each significant announcement of a medical discovery. In the year just past, Americans interested in roentgenologic diagnosis have read several such announcements.

Widest notice, perhaps, has been given to intravenous urography, the procedure by which roentgenograms of the urinary tract can be made after intravenous injection of Iopax (sodium 2-oxo-5-iodo-pyridine-N-acetate, introduced as "Uroselectan").[1] This work was begun in Germany by Lichtwitz, by Binz and by von Lichtenberg. Working at one time with Lichtwitz and later with von Lichtenberg, Swick, an American graduate student resident in Germany, applied the substance developed by Binz as a contrast medium in urologic diagnosis. Clinical trials were made in the United States and the results recently have been summarized in THE JOURNAL.

Less widely known as yet, but probably of equal importance, is an announcement by Weber.[2] He applied, with slight modification, the method of A. W. Fischer of Frankfort-on-Main in the diagnosis of polypoid lesions and polyposis of the colon. The old method of roentgenography after an opaque enema, although highly useful in disclosing deforming lesions of the colon, was of little service in gaining evidence of nondeforming soft masses that project into the lumen of

1. Braasch, W. F., and Bumpus, H. C.: Report on Sodium 2-Oxo-5-Iodo-Pyridine-N-Acetate (Introduced as Uroselectan) to the Council on Pharmacy and Chemistry of the American Medical Association, J. A. M. A. **95**: 1425 (Nov. 8) 1930. Swick, Moses: Intravenous Urography by Means of the Sodium Salt of 5-Iodo-2-Pyridon-N-Acetic Acid, ibid., p. 1403. Jaches, Leopold: Intravenous Urography (Swick Method), ibid., p. 1409.
2. Weber, H. M.: A Method for the Roentgenologic Demonstration of Polypoid Lesions and Polyposis of the Colon, Proc. Staff Meet. Mayo Clin. **5**: 326 (Nov. 12) 1930.

the bowel. Fischer's method, as employed by Weber, and as employed by Gershon-Cohen [3] in tuberculous colitis, consists first in administering an opaque enema, as in the old method. However, the patient is asked to expel this enema as completely as possible. After this has been done, what might be called an air enema is given under roentgenoscopic control. The result is that the contours of the polyps are outlined clearly in the air-filled lumen. Since the status of polyps as precancerous lesions has been conclusively demonstrated by Fitzgibbon,[4] a method by which the presence of polyps can be detected may be a life-saving measure.

Another step forward that probably will be of wide application is the observation by Kirklin [5] concerning papillomas of the gallbladder. Until recently he had assumed that cholecystographic distinction between papillomas of the gallbladder and stones of low calcium content was impossible. In a series of cases, however, he found that papillomas had certain definite roentgenologic characteristics: their shadows maintained the same position in all films on which they appeared; the small, round defects were never more than 1 cm. in diameter; they were never immediately at the fundal pole but often were marginal; defects might be single or there might be three or more, but always they were discrete; frequently the shadows were clear and usually they were most plainly visible at the twentieth hour after oral administration of the opaque dye, and the shadow of the gallbladder was of excellent density. Kirklin has offered the diagnosis in about twenty cases. Although only four of the patients were operated on, the diagnosis was confirmed in each of the four.

Continental European medical literature yielded Archer and Peterson [6] many references to roentgenologic diagnosis of ascariasis after they, independently, had correctly interpreted a film as representing this condition. They found nothing in English. Soon after ingestion of a barium sulphate cereal meal a filling defect is found in the intestine; later a stringlike shadow appears, representing the barium sulphate-filled enteric canal of the parasite.

Weber believes that use of the barium sulphate enema, followed by injection of air, will increase the accuracy of diagnosis in nearly all types of colonic disease. Kirklin hopes that it may yet be possible to diagnose carcinomas of the gallbladder in their early stages. Archer and Peterson have found that roentgenologic diagnosis of ascariasis is sometimes positive when examination of the stool for ova is negative. Possibly statistics of mortality and morbidity will show the results of these discoveries and suggestions in the near future.

3. Gershon-Cohen, Jacob: The Diagnosis of Early Ileocecal Tuberculosis, Am. J. Roentgenol. **24**: 367 (Oct.) 1930.
4. Fitzgibbon, Garrett: Polyps of the Large Intestine, Proc. Staff Meet. Mayo Clin. **5**: 157 (June 4) 1930.
5. Kirklin, B. R.: Cholecystographic Diagnosis of Papillomas and Other Tumors of the Gallbladder, Proc. Staff Meet. Mayo Clin. **5**: 336 (Nov. 19) 1930.
6. Archer, V. W., and Peterson, C. H.: Roentgen Diagnosis of Ascariasis, J. A. M. A. **95**: 1819 (Dec. 13) 1930.

THE ABSORPTION OF VITAMIN A

The studies on the physiology of the vitamins have been concerned for the most part with a consideration of their ultimate nutritional effects and of the unmistakable manifestations of avitaminosis. The fate of these indispensable food factors in the body has received comparatively little attention. Theories of the precise mode in which the various known vitamins function still have little more than their authors' enthusiasms to commend them. Even the behavior of the vitamins at the portals of the organism, that is, in the alimentary tract, remains largely a matter of conjecture. There are indications that vitamins do not require digestive alteration in the sense in which proteins or polysaccharides necessitate digestive hydrolysis before they can be properly assimilated; for vitamin-bearing solutions have been employed effectively by introduction parenterally into the body. Koehne and Mendel,[1] for example, observed in animal tests that both vitamins A and D in cod liver oil can be utilized when the oil is administered by ways other than the gastro-intestinal tract.

It is important also to know something about the comparative utilization of vitamins when they are consumed in the usual manner as part of the diet. Human urine [2] has been demonstrated to contain vitamin B. Whether this represents an excretion of a surplus or the normal elimination of vitamin is not determined. The possible loss of vitamins in the feces has not been extensively investigated except so far as there is no doubt of the occurrence of such food factors in the excreta. Whether they are produced by intestinal micro-organisms or represent unabsorbed fractions of the intake remains to be ascertained.

In an elaborate investigation of the fate of vitamin A in children at the Department of Child Welfare, State University of Iowa, Rowntree [3] has established the fact that vitamin A is not excreted through the urine of young children and infants even when generous amounts are fed. If there is a limit to their capacity to store vitamin A, it is not indicated by alimentary vitaminuria. Without exception, a marked fecal loss of vitamin A occurred. That this loss was not entirely dependent on the intake is shown, according to Rowntree, by the fact that two of the infants fed a diet low in vitamin A excreted a larger amount than they ingested. The loss with different children on different diets varied from 2 to 12 per cent of the intake, the largest loss occurring with the largest intake. The greatest retention also occurred on the greatest intake. Since the fecal fat excretion of infants is normally within this range, it seems evident that the loss of vitamin runs parallel with the loss of fat. The vitamin A of egg yolk and of cod liver oil appear to be equally well utilized. There are records of pathologic conditions of the alimentary

1. Koehne, Martha; and Mendel, L. B.: The Utilization of Fatty Oils Given Parenterally, J. Nutrition **1**: 399 (May) 1929.
2. Muckenfuss, A. M.: J. Am. Chem. Soc. **40**: 1606, 1918.
3. Rowntree, Jennie I.: A Study of the Absorption and Retention of Vitamin A in Young Children, J. Nutrition **3**: 265 (Nov.) 1930.

tract that have undoubtedly deprived patients of the benefit of ingested vitamins. Under ordinary circumstances, however, evidently the absorption of vitamin A rarely presents a serious problem to the student of nutrition.

Current Comment

DISCLOSURE OF DISEASES UNDER PROHIBITION ACT ABOLISHED

Physicians who prescribe liquor need not state on the stubs of their prescriptions the ailments for which it is prescribed. The item on the stubs of outstanding prescription blanks calling for this information may be ignored. When new prescription blanks are printed, the item calling for such information will be omitted. The Wickersham Commission, in its report released January 20, recommended that physicians prescribing under the National Prohibition Act be no longer required to state on blanks going into the public files the ailments for which prescriptions are given. Two days later, the Commissioner of Industrial Alcohol issued a circular letter instructing all supervisors of permits under the act that ailments need no longer be stated on the stubs of prescriptions and directed them to advise the physicians in their several districts to that effect. Physicians are still required, by the National Prohibition Act itself, to keep in their offices book records of prescriptions for liquor, including records of the ailments for which it is prescribed, subject to inspection by prohibition officers.

THE SYNTHESIS OF ARGININE IN THE BODY

The story of the behavior of proteins in the body has become identified with the record of the metabolism of amino-acids. Proteins do not enter the circulation as such from the alimentary tract. The processes of digestion disintegrate the albuminous foodstuffs, liberating amino-acids or comparatively simple complexes of the latter—the so-called polypeptides. It is the nitrogenous fragments of this sort that enter into the nutritive processes, either becoming synthesized again into protein substances characteristic of the various fluids and tissues of the organism, or further broken down with the liberation of energy. In the latter case specific hormones or other tissue "principles" may be formed—or the nitrogenous catabolites may be excreted, notably as urea. It is an engrossing question whether all of the twenty or more amino-acid derivatives of proteins need to be supplied preformed to the body or whether any of them can be constructed in the organism from other nitrogenous precursors, as happens in plants. The latter "build" proteins de novo from comparatively simple soil constituents and carbon dioxide. The nutrition investigations of the past two decades have left no doubt that tryptophan, lysine, cystine and histidine are indispensable dietary components. They must be furnished preformed either as such or, as is the usual case, available in edible proteins. Regarding other amino-acids the evidence has in most cases been inadequate or conflicting. Recently, however, Scull and Rose [1] of the University of Illinois at Urbana have clearly demonstrated in well conceived and executed animal experiments that arginine is not an indispensable amino-acid. Comparative studies were made of the increase of tissue arginine incidental to growth and the arginine intake when the diet was poor in sources of the amino-acid. The increments in tissue arginine were several times as large as could be accounted for by arginine ingestion. Evidently in some species, at least, arginine can be synthesized by the animal organism and hence is not an essential component of the intake. Most nitrogenous foods yield some arginine, so that the finding referred to is perhaps more of academic than of immediately practical interest.

Association News

THE ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE AND HOSPITALS

Every year since 1904 the Council on Medical Education and Hospitals has conducted an Annual Congress on Medical Education and Licensure, which since 1920 has included hospitals and other related subjects. To these conferences have regularly been invited university presidents, deans of medical schools, secretaries of state licensing boards and other educators interested. In 1930 the Council divided the conference into sections and the meeting extended as formerly over three days, which gave a better opportunity for the discussion of a larger number and variety of subjects. The conference this year will be held February 16, 17 and 18 at the Palmer House, Chicago, the central topic for discussion being the care of patients suffering from nervous and mental diseases. The subject will be presented from three interesting angles; viz., care of the mentally ill, mental hygiene, and the teaching of psychiatry. All those interested in this highly important field are invited to attend the conference.

THE PHILADELPHIA SESSION

Time Limit for Applications for the Scientific Exhibit

The Committee on Scientific Exhibit calls attention to the fact that all applications for the Scientific Exhibit must be in the hands of the director before February 20. Any who desire an application blank may obtain it by sending a request to Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

As previously announced, there will be nine section exhibits. Applications of participants in any of the section exhibits should be sent at once to the chairman of the committee on section exhibit, as follows: For the Section on Radiology, address Dr. Henry K. Pancoast, X-Ray Laboratory, University Hospital, Philadelphia; for the Section on Dermatology and Syphilology, Dr. Fred D. Weidman, Thirty-Sixth Street and Hamilton Walk, Philadelphia; for the Section on Obstetrics, Gynecology and Abdominal Surgery, Dr. Fred J. Taussig, 3720 Washington Boulevard, St. Louis; for the Section on Ophthalmology, Dr. W. C. Finnoff, 1612 Tremont Street, Denver; for the Section on Nervous and Mental Diseases, Dr. Thomas J. Heldt, Henry Ford Hospital, Detroit; for the Section on Laryngology, Otology and Rhinology, Dr. Austin A. Hayden, 25 East Washington Street, Chicago; for the Section on Diseases of Children, Dr. F. Thomas Mitchell, 376 South Bellevue, Memphis, Tenn.; for the Section on Urology, Dr. George Gilbert Smith, 6 Commonwealth Avenue, Boston; for the Section on Preventive and

1. Scull, C. W., and Rose, W. C.: Arginine Metabolism: I. The Relation of the Arginine Content of the Diet to the Increments of Tissue Arginine During Growth, J. Biol. Chem. 89: 109 (Nov.) 1930.

Industrial Medicine and Public Health, Dr. P. A. Davis, 1433 Delia Avenue, Akron, Ohio.

From the interest shown and the applications received to date, the exhibit at the Philadelphia Session will be an event in the history of the Association.

CONTRIBUTIONS FOR MEDICAL SALON IN PERSHING HALL

The sum contributed this week for the Pershing memorial in Paris brings the total to $1,416.60. The list of those who have contributed during the current week follows:

Col. Albert Knecht Detwiller, New York
Walter F. Donaldson, M.D., Pittsburgh
R. E. Mason, M.D., St. Louis
U. D. Millare, M.D., East Chicago, Ind.
Charles S. Austin, M.D., Carrollton, Mo.
W. W. Bauer, M.D., Racine, Wis.
S. W. Thieme, M.D., Ravenna, Mich.
Arthur H. Hauber, M.D., Chicago
Howard Lilienthal, M.D., New York
W. D. Griesemer, M.D., Reading, Pa.
Mildred J. Bode, M.D., Cincinnati
A. W. Bitting, M.D., San Francisco
deWayne G. Richey, M.D., Pittsburgh
G. F. Moore, M.D., Mount Clemens, Mich.
S. C. Hollis, M.D., Adams, N. Y.
David Baker, M.D., Fort Bragg, N. C.
Richard D. Clippinger, M.D., Vineland, N. J.
C. M. Wray, M.D., Iowa Falls, Iowa
J. Slater Crawford, M.D., Pittsburgh
T. Stuart Hart, M.D., New York
Sander E. Lachman, M.D., Baltimore
Arthur Miltenberger, M.D., Johnstown, Pa.
S. Ormand Goldan, M.D., New York
Walter S. Siewerth, M.D., Chicago
William B. Scull, M.D., Frankford, Philadelphia
A. C. Eitzen, M.D., Hillsboro, Kan.
E. Haberman, M.D., Osakis, Minn.
Carl R. Steinke, M.D., Akron, Ohio
I. M. Unger, M.D., Ithaca, N. Y.
G. E. Barbour, M.D., Somerville, N. J.
Harry A. Davidson, M.D., Louisville, Ky.
G. B. Capito, M.D., Charleston, W. Va.
Henry F. Stoll, M.D., Hartford, Conn.
Ralph L. Reynolds, M.D., Waterville, Maine
Albert H. Damon, M.D., Limestone, Maine
Aaron M. Lefkovits, M.D., New York
F. N. Bunnell, M.D., Barnegat, N. J.
Joseph Prendergast, M.D., Chicago
Nicholas I. Ramos, M.D., Newark, N. J.
Edmund Prince Fowler, M.D., New York
Daniel Petersen, M.D., Herington, Kan.
James E. Talley, M.D., Philadelphia
Harry E. Klebanoff, M.D., New Haven, Conn.
John Roland Upton, M.D., San Francisco
W. R. Neumarker, M.D., Columbus, Neb.
Clinton Enos, M.D., Denver
S. H. Babington, M.D., Berkeley, Calif.
Lester H. Hills, M.D., Elmhurst, Ill.
George E. Barksdale, M.D., Asheville, N. C.
George B. Lake, M.D., North Chicago, Ill.
C. E. Wagner, M.D., Wilmington, Del.
Walter Stevenson, M.D., Quincy, Ill.
Richard B. Cattell, M.D., Boston
George Strong Derby, M.D., Boston
Franklin W. Roush, M.D., St. Petersburg, Fla.
Rudolph Bloom, M.D., Philadelphia
Chester J. Challenger, M.D., Chicago
J. D. Carr, M.D., Jamestown, N. D.
M. L. Turner, M.D., Berwyn, Md.
C. E. V. Kennon, M.D., Providence, R. I.
Alexander Randall, M.D., Philadelphia
Milton A. Davison, M.D., Marlin, Texas
Archie L. Dean, Jr., M.D., New York
L. Hudson Smythe, M.D., Stockton, Calif.
Herbert W. Foster, M.D., Montclair, N. J.
H. T. Kristjanson, M.D., Milwaukee
E. Stanley Abbot, M.D., Boston
Emily J. Heisz, M.D., Los Angeles
H. D. Corbusier, M.D., Plainfield, N. J.
C. J. Schmelz, M.D., Guerneville, Calif.
Harry N. Sutherland, M.D., Ely, Minn.
W. Barclay Stephens, M.D., Alameda, Calif.
Thornton M. Shorkley, M.D., Carpinteria, Calif.
Knox Bacon, M.D., San Diego, Calif.
H. Earle Conwell, M.D., Birmingham, Ala.

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts at 10 a. m. on Monday, 10:45 on Tuesday, 10:45 on Thursday and 10 on Saturday, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week is as follows:

February 9. Smoke and Air Pollution in a Modern City.
February 10. The Pharmacist and the Public Health.
February 12. We Need Pure Air.
February 14. The Pharmacist's Responsibility in Community Health.

Five minute health talks may be heard over the Columbia Broadcasting System daily except Sundays and holidays from 12 to 12:05 p. m.

The program for the week is as follows:

February 9. Young Hearts.
February 10. Can You Take It on High?
February 11. Donating Life.
February 12. Is Your Heart Right?
February 13. Parasites of Farm Animals.
February 14. The Water at Your Faucet.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Personal.—Dr. Meade Clyne, Tucson, was recently appointed health officer of Pima County, succeeding Dr. Edward J. Gotthelf, Jr. Dr. Lewis H. Howard was appointed assistant.

Bills Introduced.—H. 74 proposes to create a board of barbers and cosmeticians and to regulate the practice of barbering and cosmetology. H. 23 proposes to regulate the possession, sale, transportation, dispensing or giving away of narcotic drugs. H. 36 proposes to authorize the formation of hospital districts to establish, erect and maintain district hospitals. H. 58 proposes to create a state board of registration in drugless healing and to regulate the practice of drugless healing, "except chiropractors and homeopaths." This bill has been recalled, by request of the introducer, from the committee to which it was referred and has been laid on the table.

ARKANSAS

Personal.—Dr. William P. Parks, Hot Springs National Park, was elected president of the state board of health, January 8, to succeed Dr. Lorenzo D. Duncan, Waldron.—Dr. Hugh A. Browne, Kansas City, Mo., has been appointed superintendent of the new Negro tuberculosis sanatorium at Alexander, it is reported.

Bills Introduced.—S. 48 proposes to repeal the basic science act and the law regulating the practice of nonsectarian medicine, homeopathy and eclecticism. It proposes a new medical practice act and provides for the appointment of a board of medical examiners, to be composed of three nonsectarian, two eclectic and two homeopathic practitioners. The following cults are exempt from the provisions of the bill: osteopathy, chiropractic, optometry, chiropody and Christian science. If this bill is enacted, chiropractors and osteopaths need pass no examination in the basic sciences and will be licensed by their cult boards. H. 79 proposes to exempt chiropractors from the provisions of the present basic science act. H. 15 proposes to create a board of barber examiners and to regulate the practice of barbering, authorizing licentiates of the board to "remove superfluous hair, warts, moles or other blemishes from the scalp, face, neck or upper part of the body."

COLORADO

Society News.—Dr. Byron B. Blotz, Rocky Ford, addressed the Larimer County Medical Society, February 4, on "Medical Economics."——Dr. Charles W. Dorsey, Jr., discussed "Occipitoposterior Presentation with Particular Reference to Scanzoni's Maneuver" before the Medical Society of the City and County of Denver, January 20; Dr. Thomas M. Hopkins spoke on "Bandl's Ring," and Dr. Harry H. Wear, "Prostatic Hypertrophy," illustrated by motion pictures.

Bills Introduced.—S. 345 proposes to permit the board of county commissioners of any county to organize a county board of health, to consist of one county commissioner, the county superintendent of schools and three others, to be selected at large by the board of county commissioners. Such board of health when organized may employ a licensed physician as a county health officer and such other personnel, including a public health nurse, as may be necessary. On the establishment of this board of health the local boards of health, except those having full time health departments and health officers, are to be abolished. S. 57 proposes to make it a misdemeanor to display a sign over premises which would indicate that a pharmacy or drug store is maintained there, unless the owner or lessee of the premises is licensed by the state board of pharmacy. H. 221 proposes to provide for the establishment of a state tuberculosis sanatorium in Denver, to be known as the Tuberculosis Sanatorium of the University of Colorado. S. 134 proposes to create a state board of cosmetologists and to regulate the practice of cosmetology. S. 58, to amend the chiropody practice act, proposes to define the term chiropody as "the examination and diagnosis of the human foot and the medical and mechanical treatment thereof, and the surgical treatment of abnormal nails,

corns, warts and callosities of the feet and the superficial treatment of bunions and other abnormalities of the feet." H. 161 proposes to authorize the board of county commissioners of any county, the council of any incorporated city or town, the school boards of any school district or the governing body of any state educational institution to employ one or more registered public health nurses.

CONNECTICUT

Dr. Ferris Honored.—A portrait of Dr. Harry Burr Ferris has been presented to the Yale University School of Medicine, New Haven, by his former students and colleagues. The picture was painted by John Quincy Adams of Vienna and will hang in the Ferris room, a library and seminar room for the use of students of anatomy. Professor Ferris has been a teacher of anatomy at Yale for forty years. He took his B.A. degree at Yale in 1887 and graduated from the medical school in 1890. In 1895 he was made professor of anatomy and in 1897 was appointed E. K. Hunt professor of anatomy, which position he now occupies.

INDIANA

Bills Introduced.—H. 220 proposes to provide for the sexual sterilization of idiot, imbecile and feebleminded inmates of state institutions. H. 219 proposes to accord liens to hospitals, physicians, surgeons, nurses or undertakers, performing services for persons who have suffered personal injuries, on any settlements or judgments obtained by the injured persons, or their representatives, by reason of the injuries.

Society News.—Dr. Arthur M. Mendenhall, Indianapolis, addressed the Hendricks County Medical Society, Danville, January 23, on "Some Newer Things in Obstetrics."——Dr. Bertis C. Gwaltney, Francisco, addressed the Gibson County Medical Society, January 12, on "Acute Rheumatic Fever."——Dr. Eugene L. Hedde, among others, addressed the Cass County Medical Society at Logansport, January 15, on "Leukocytosis in Noninflammatory Conditions."——Rolla N. Harger, Ph.D., Indianapolis, addressed the Wayne-Union County Medical Society, January 15, on alcohol from the medicolegal standpoint.——Dr. Edwin N. Kime, Indianapolis, addressed the Tippecanoe County Medical Society, January 8, on "Constructive vs. Destructive Physical Therapeutics."——Dr. Robert S. McCaughey, Danville, Ill., addressed the Elkhart County Medical Society, January 8, on colitis.——Dr. Dudley F. Davis addressed the Floyd County Medical Society, New Albany, January 9, on prostatitis.——Drs. William N. Wishard and William N. Wishard, Jr., Indianapolis, addressed the Hancock County Medical Society, Greenfield, January 2, on "Benign Tumors of the Prostate."——Dr. Frederick A. Coller, Ann Arbor, Mich., addressed the St. Joseph County Medical Society, February 7, at South Bend, on "Postoperative Pulmonary Complications."

IOWA

Society News.—Dr. John L. Kestel, Waterloo, addressed the Des Moines Academy of Medicine and the Polk County Medical Society, January 27, on "Objective Diagnosis Methods of Kidney Disorders," and Dr. Thomas F. Thornton, Waterloo, "Stone in the Ureter."

Bills Introduced.—S. 67 proposes to require all practitioners of the healing art to report to the sheriff of the county within twelve hours after treating any cases in which there has been an injury of violence. H. 29 proposes to designate as a podiatric physician a person licensed as a podiatrist. H. 30 proposes to allow licensed podiatrists to use alcohol for the purpose of sterilization, preparation of microscopic slides, or other like nonbeverage purposes.

County Health Unit to Collaborate with University.—The first county health unit to come under the provisions of the state law enacted by the last general assembly was organized for Des Moines County at Burlington, January 17. The unit, which started functioning, February 1, will be in charge of Dr. Carl F. Jordan, assistant professor of hygiene and preventive medicine at the State University of Iowa College of Medicine. It will take over Red Cross and social service work and the duties of city physician, milk inspector and school nurses. This unit will be a training school for physicians desiring instruction in public health work, and also an extension department of the state university, although the classroom work will be done at Iowa City. The extension work of the state university will probably not be undertaken for several months.

KANSAS

Personal.—Dr. William C. Burnaman, Washington, has been appointed a member of the state board of medical registration and examination to succeed Dr. Albert S. Ross, Sabetha.

Court of Appeals Sustains Revocation of Brinkley's Radio License.—The Court of Appeals of the District of Columbia has affirmed the denial of the Federal Radio Commission to renew the radio license of "Dr." John R. Brinkley's station, KFKB, of Milford.

Bills Introduced.—H. 182 proposes that in any advertising of any food or medicine the net weight shall be in type of equal size to the largest type used for either the name or the advertised price. H. 108 proposes to require every person owning a dog to have said dog vaccinated, inoculated or otherwise treated each year by any registered veterinarian to prevent the disease of rabies. H. 114 proposes to add to the present grounds for divorce incurable insanity of the defendant, contracted subsequent to marriage and continuing for more than three years. S. 52 and H. 141 provide that a divorce may be had for the incurable insanity of one spouse who has been insane for five years or more.

MAINE

Bills Introduced.—H. 51 proposes to create a board of naturopathic examination and registration and to regulate the practice of naturopathy, defined as "the practice of hydrotherapy, electrotherapy, physiotherapy, heliotherapy, pneumotherapy, somatherapy, biochemistry, neurotherapy, iris-analysis, mechanotherapy, articular manipulations, massage, phototherapy, corrective and orthopedic gymnastics, chromotherapy, phagotherapy, histolotherapy, dietetics and external applications. Naturopathy is hereby declared not to be the practice of medicine, major surgery, osteopathy or chiropractic, Christian science or other religious healing sciences or faiths." H. 52 proposes to create a board of barber examiners and to regulate the practice of barbering.

MASSACHUSETTS

Research in Rheumatic Fever.—A study of rheumatic fever is to be made at the House of the Good Samaritan, Boston, under an appropriation from the Commonwealth Fund, New York, which has provided $17,100 annually for the next two years. This hospital has fifty-four beds devoted exclusively to rheumatic infections, said to be the largest group of its kind in the United States.

Society News.—Dr. William R. Morse of the West China Union University addressed the Boston Medical History Club, January 19, on "Principles Underlying Chinese Medical Practices." There was an exhibition of Chinese medical classics.——Dr. Charles G. Mixter, among others, addressed the Norfolk District Medical Society, January 27, in Boston, on "Congenital Esophageal Atresia."——Dr. Esmond R. Long, Chicago, addressed the Harvard Medical Society, January 27, on "High Points in the History of Pathology."——Dr. Reginold D. Margeson presented motion pictures of the transverse cervical abdominal cesarean section before the Belmont Medical Society, January 30.——Drs. Franklin White, Arial W. George and P. P. Johnson conducted a symposium on duodenal ulcer before the Essex South District Medical Society, January 7.

Bills Introduced.—S. 43, to amend the law prohibiting the distribution of contraceptive instruments or dissemination of contraceptive information, proposes to exempt from its provisions (1) an article or prescription used for the protection of health or for the cure or prevention of disease, by a duly registered physician or by the direction or prescription of such physician, (2) treatment and prescription given for such purposes by chartered hospitals, and (3) teaching in chartered medical schools, writings in standard medical journals or the publication of standard medical books. S. 174, to amend the pharmacy practice act, authorizes the appointment of three agents to work under the direction of the board of pharmacy, to investigate and report violations of the laws relating to pharmacy. H. 288 proposes to create a department of public medicine and health to take over the activities of the department of public health, the department of mental diseases and certain activities of the department of public welfare and the department of industrial accidents. H. 167 proposes to require the department of public health to publish and distribute to every voter information relating to cancer

MINNESOTA

Bill Introduced.—H. 81 proposes to appropriate $350,000 for the construction and equipment of a psychopathic hospital unit, to be a part of the Minnesota General Hospital.

Unlicensed Practitioner Fined.—George R. Viger, who has practiced healing in St. Paul for fourteen years, was sentenced, December 10, by Judge R. D. O'Brien in the district court to pay a fine of $200 and to serve a year in jail for practicing healing without a basic science certificate, according to a report from the state board of medical examiners. The fine was paid, but the jail sentence was suspended on condition that Viger refrain from practicing healing in Minnesota. From 1920 to 1927 Viger called himself a physician and surgeon, but recently had called himself a "naturopathic physician."

Personal.—Dr. Frances R. Vanzant, Rochester, has been awarded the first fellowship available under the Josiah Macy, Jr., Foundation. She will work on the physiology of gastric secretion under the direction of Dr. Walter C. Alvarez of the Mayo Foundation at Rochester.——Dr. Russell R. Hendrickson, formerly with the Minnesota State Sanatorium, Ah-gwah-ching, has been appointed superintendent of the Fair Oaks Lodge Sanatorium, Wadena.——Dr. Harry T. Hillstrom, Minneapolis, has been appointed head of the department of roentgenology and radiotherapy at Vanderbilt University, Nashville.

Society News.—Dr. Edward Schons presented a paper on "Significance of Gas Distention in Diagnosis of Small Intestinal Obstruction and Stasis" before the Ramsey County Medical Society, St. Paul, recently; Dr. Gordon R. Kamman reported a case of "Alcoholic Polyneuritis with Cranial Nerve Involvement — Korsakow Syndrome." —— Lieut. Gov.-Elect Henry Arens, among others, addressed the Scott-Carver County Medical Society, Jordan, Dec. 9, 1930, on medical legislation. ——Dr. Edward A. Meyerding, Rochester, addressed the Red River Valley Medical Society, Dec. 9, 1930, on public relations and Dr. Robert M. Burns, on "The Trend of Medicine."—— Dr. Edward C. Rosenow, Rochester, addressed the Rice County Medical Society, Dec. 11, 1930, on poliomyelitis.——Dr. Emil S. Geist, Minneapolis, delivered the presidential address before the Minnesota Academy of Medicine, January 14, on "Recent Advances in the Pathology of the Spine, with Clinical Observations."

MISSOURI

Hospital News.—A cancer fund has been established by the Barnard Free Skin and Cancer Hospital, St. Louis, with an anonymous gift recently donated as a memorial to J. William Frank, a St. Louis citizen who died of cancer. Conditions of the gift stipulate that this become a separate fund and the income be used in the aid of cancer patients and for expenses that cannot be met by current funds of the hospital. In the event a cure for cancer is discovered, the entire amount can be spent. The hospital, which was established in 1905, has forty beds and an outpatient department.

Society News. — Dr. Morris H. Clark, Kansas City, addressed the Jackson County Medical Society, January 20, on "Medical Business"; the society was addressed, January 27, by Drs. Scott P. Child, Mount Vernon, on tuberculosis; Elmer E. Glenn, Mount Vernon, "Massive Lung Collapse: Its Treatment," and Richard L. Bower, Kansas City, "Massive Atelectasis of the Lung"; the speaker, February 3, was Dr. LeRoy S. Peters, Albuquerque, N. M., on "Cauterization of Adhesions in Artificial Pneumothorax."——Dr. Charles E. Hyndman was installed as president of the St. Louis Medical Society, recently, succeeding Dr. Vilray P. Blair.

Appointments at St. Louis University School of Medicine.—The following appointments to the administrative board of St. Louis University School of Medicine were recently announced: Edward A. Doisy, Ph.D., professor of biochemistry; Dr. William H. Luedde, professor of ophthalmology, and Dr. William E. Sauer, professor of otolaryngology. Other changes at the school include the promotion of Dr. Augustus G. Pohlman, for sixteen years director of the department of anatomy, to full time graduate instruction and research work. He will be succeeded by Dr. Daniel M. Schoemaker, acting director of the department of anatomy. Dr. Albert Kuntz, acting director, department of micro-anatomy, will be director.

Bills Introduced.—S. 38, to amend that section of the optometry act enumerating persons exempted from its operation, proposes to exempt persons or firms manufacturing or dealing in eyeglasses in permanently established places of business, who neither practice nor attempt to practice optometry and who do not use a trial case, trial frame, test card, vending machine or other mechanical means to assist the customer in selecting glasses. H. 113 proposes to provide partial state support for counties or cities maintaining approved hospitals for the insane. H. 145 proposes to authorize the council of a municipal corporation, among other things, to levy and collect license taxes and to regulate physicians, chiropractors, osteopaths, hospitals, sanatoriums and health schools. H. 20 proposes to prohibit any person from selling, at retail, as merchandise, any spectacles, eyeglasses or lenses for the correction of vision, unless a duly licensed physician or duly qualified optometrist be in charge of or in personal attendance at the place of sale.

NEW HAMPSHIRE

Bills Introduced.—H. 63 proposes to accord liens to physicians and hospitals performing services for a person who has suffered personal injury, on any sum due or which may become due to the injured person by reason of the injury. H. 169 proposes as an additional ground for the revocation of a license to practice medicine the conviction of a licensee of homicide as the result of malpractice. H. 124 proposes to define a chiropodist, within the meaning of the chiropody practice act, as "one who examines, diagnoses or treats medically, mechanically or surgically the ailments of the human foot and massage in connection therewith, except the amputation of the toes or foot or the use of anesthetics other than local."

NEW JERSEY

Bill Introduced.—A. 63 proposes to establish a procedure to cancel hospital lien notices on file with county clerks, when the hospital bills have been satisfied, in cases where liens have been recorded in favor of hospitals furnishing care and treatment to persons injured in accidents.

NEW YORK

Society News.—Dr. John L. Kantor, New York, addressed the Binghamton Academy of Medicine, January 20, on "Relation of Congenital Anomalies to Digestive Neurosis."—— Dr. George Emerson Brewer, New York, addressed the Medical Society of the County of Nassau, January 27, at Garden City, on "Fossil Man."

Bills Introduced. — S. 86 proposes to provide that each newly born baby in a hospital shall be fingerprinted, tagged, and kept in a separate receptacle, which shall bear the name of its parent or parents, and that on discharge from the hospital its fingerprints shall be checked with the fingerprints taken at birth. S. 263 proposes to create in the educational department a division of medicinal liquor and to regulate the prescribing and dispensing of medicinal liquor. S. 278 and A. 451, to amend the workmen's compensation act, propose to designate as occupational diseases all diseases arising out of or occurring in the course of an employment covered by the act, or disabilities arising as the natural and unavoidable result of such employment. S. 343 proposes to create a temporary state commission and to appropriate $50,000 for the acquisition of a site for a new institution for the care and custody of mental defectives. S. 361 proposes to create a board of chiropractic examiners and to regulate the practice of chiropractic, therein defined as the "diagnosis, the palpating and adjusting by hand of the vertebral column and tissues. This shall not include the use of operative surgery or obstetrics or the administering or prescribing of drugs or medicine included in the pharmacopeia or materia medica." S. 344 and A. 442 propose to create in the department of mental hygiene a board of psychiatric examiners to license certified psychiatrists, who must be licensed physicians of at least five years' experience in actual practice and either have had three years' experience in the care and treatment of mental diseases in an institution or have devoted five years immediately preceding their licensing to private practice confined wholly or substantially to nervous and mental diseases. A. 227 proposes to make it unlawful for any person to sell at retail or give away bichloride of mercury, mercuric chloride or corrosive sublimate, except on the prescription of a licensed physician. Such compounds when so sold shall be in the form of tablets of distinctive shape and color and shall be in a container labeled "for external use only." The sale and dispensing of bichloride of mercury when combined with one or more other drugs or excipients, for purposes of external medication only, are excepted from the provisions of this bill. S. 47 proposes to prohibit the sale of

food in pharmacies. A. 133 proposes, among other things, that the insanity of one spouse shall entitle the other to maintain an action for divorce. S. 178 and S. 211, to amend the workmen's compensation law, propose to make all occupational diseases arising out of any employment compensable.

New York City

In Honor of Dr. Ewing.—Dr. James Ewing, professor of pathology, Cornell University Medical College, was the guest of honor at a dinner given by the board of Memorial Hospital, January 31, at which he was presented with the homage volume issued to mark his sixty-fourth birthday. Dr. George D. Stewart was toastmaster and among the speakers were Dr. Hugh S. Cumming, surgeon general, U. S. Public Health Service; Dr. James B. Murphy, Dr. John A. Hartwell, Dr. Francis Carter Wood, Dr. G. Canby Robinson and Dr. Frank E. Adair, all of New York; Dr. Howard A. Kelly, Baltimore; Clarence C. Little, LL.D., managing director, American Society for the Control of Cancer; Dr. Livingston Farrand, president, Cornell University; Thomas DeBevoise, New York attorney, and Archibald Douglas, of the board of managers of Memorial Hospital. About 400 physicians were present.

Columbia Absorbs Post-Graduate Medical School.—The New York Post-Graduate Medical School and Hospital will become a part of Columbia University, July 1, according to an announcement at the annual dinner of the Post-Graduate Faculty Association, January 31. An administrative board of postgraduate studies in medicine, representing both institutions, has been established. Nicholas Murray Butler, president of Columbia University, has been elected a member of the corporation and of the board of directors of the Post-Graduate Medical School and Hospital and becomes ex officio president of the medical school. Dr. Arthur F. Chace, president of the Post-Graduate, said that the new arrangement linking the graduate study of medicine with university facilities for research, would make the school the center of a comprehensive program of graduate medical teaching to be sponsored by Columbia. The New York Post-Graduate Medical School and Hospital was founded in 1875 as a department of New York University Medical School, becoming independent in 1882; records show that 27,324 physicians have received instruction at the school.

NORTH DAKOTA

Bills Introduced.—H. 76 proposes to create a board of naturopathic examiners and to regulate the practice of naturopathy, which is defined as "including physiotherapy and . . . as a healing system, the science and art of applied natural therapeutics, hygiene, sanitation or combination thereof, which enables the naturopathic physician to direct, advise or prescribe: food, water, light, heat, color, exercises, active and passive manipulation, nontoxic herbs, roots and barks, electrical and mechanical instruments or appliances, except x-ray, to assist nature to restore a normal state of health." The act further defines herbs, in the foregoing definition, to mean the leaves, roots, barks, pulp, seeds of vegetables, plants, shrubs and trees which are harmless in their nature to the human body and are commonly known to be nontoxic or nonpoisonous. H. 86 prohibits any person from experimenting or operating in any manner on any living animal for any purpose other than that of healing or curing such animal. H. 67 proposes to require every medical licentiate to register annually with the board of medical examiners and to pay an annual fee of $5. Licentiates not residing within the state are to pay an annual registration fee of $2. H. 69, to amend the cosmetology practice act, proposes to define the practice of cosmetology to include the removing of superfluous hair, by the use of electricity or otherwise. S. 143 seeks to prohibit all public hospitals and hospitals exempt from taxation from barring their facilities to any duly licensed physician who complies with all reasonable rules and regulations of such hospitals, relating to the conduct of physicians therein. Where the reasonableness of any rule or regulation is in dispute, either party may demand a finding from the state board of medical examiners.

OHIO

Society News.—A symposium on medicine and law was conducted before a joint meeting of the Cleveland Bar Association and the Cleveland Academy of Medicine, January 6; the speakers included Albert E. Powell and M. C. Harrison, and Drs. Howard T. Karsner and Harry H. Drysdale.——The Summit County Medical Society was addressed at Akron, February 3, by Dr. John B. Carnett, Philadelphia, on "Simulation of Various Intra-Abdominal Lesions by Intercostal Neuralgia of the Abdominal Wall."

Bills Introduced.—H. 4 would, apparently, if enacted, permit all osteopaths licensed in the future to prescribe and dispense drugs. It proposes to allow present osteopathic practitioners to prescribe and administer drugs, other than anesthetics and antiseptics, after passing an examination in materia medica and therapeutics, given by a member of the osteopathic examining committee. An applicant desiring to practice major surgery and to be designated as an osteopathic physician and surgeon may be examined by the state medical board in anatomy, physiology, obstetrics, surgery and diagnosis. In determining whether or not an applicant passes the examination in the enumerated subjects the medical board must average his grades in these subjects with the grades obtained in his examination before the osteopathic examining committee. All osteopathic applicants, except present practitioners and present students, to be eligible to take the examination given by the medical board, must present evidence of completing satisfactorily two years of work in a college approved by the medical board and must also present a certificate from an osteopathic examining committee that he has passed an examination in pathology, bacteriology, physiologic chemistry, gynecology, osteopathic diagnosis, materia medica and therapeutics. H. 30 proposes to create a state board of barber examiners and to regulate the practice of barbering. H. 57 proposes to safeguard the distribution of caustic or corrosive substances, as defined in the Federal Caustic Poison Act, by requiring their labeling as "poison." H. 35 seeks to provide that the course in science in all educational institutions supported by money from the state shall include emphasis on the effects of the use of alcoholic drinks and of narcotics on the human system.

OKLAHOMA

Bill Introduced.—H. 64 proposes to provide for the sexual sterilization of insane, idiotic, imbecile, feebleminded or epileptic inmates of state institutions.

Society News.—At a meeting of the Ottawa County Medical Society, Miami, Dec. 19, 1930, speakers and their subjects were: Drs. William W. Jackson, Hot Springs National Park, Ark., "Spinal Anesthesia—History, Development and Limitations"; Arthur E. Hertzler, Halstead, Kan., "Bronchocele—Its History, Etiology and Treatment," and Myron S. Gregory, Oklahoma City, "Early Home Life and Its Relation to Illness."

PENNSYLVANIA

Society News.—Dr. George F. Suker, Chicago, will address the Pittsburgh Ophthalmological Society, February 23, on "Retinal Complications in Cardiovascular Lesions."

Philadelphia

Personal.—Dr. John Montgomery Baldy, formerly head of the state department of welfare, has been appointed medical director of the municipal court of Philadelphia; he will succeed Dr. Thomas A. Shallow, who resigned recently after he had been appointed professor of surgery at Jefferson Medical College. Dr. Donald G. Davidson was appointed to the newly created position of psychiatrist of the court staff.——Dr. Frank C. Hammond was elected president of the Medical Club of Philadelphia at its annual meeting, January 16, and Dr. William S. Wray, secretary.

Society News.—Dr. George Wilson discussed "Diagnosis and Treatment of General Paresis" in the series of graduate seminars, given under the auspices of the Philadelphia County Medical Society, January 30.——Drs. Albert E. Bothe and George E. Pfahler addressed the Philadelphia Urological Society, January 26, on "Pathology of Vesical Tumors" and "Diagnosis and Treatment of Bladder Tumors from the Roentgenologic Standpoint," respectively.——Dr. Mary H. Easby addressed the Medical Club of Eastern Delaware County, January 27, on "Cardiovascular Heart Disease as a Problem for the General Practitioner."——Drs. Samuel Axilbund and Louis K. Elfman addressed the West End Medical Society, January 21, on "Sterility in Women" and "Rectal Anesthesia in Otolaryngology," respectively.

SOUTH CAROLINA

Bills Introduced.—S. 22 and H. 64 propose to establish a free venereal disease clinic for Spartanburg County, under the supervision of the United States Public Health Service and the state board of health.

TENNESSEE

Bills Introduced.—H. 227 and H. 316 propose to create a board of registration of chiropody and to regulate the practice of chiropody, which is defined as the examining, diagnosing or treating medically, mechanically or surgically of the ailments of the human foot and massage in connection therewith, except the amputation of the toes or foot, or the use of anesthetics other than local.

Sir William Hardy to Lecture at Vanderbilt.—Sir William B. Hardy, director of the low temperature research station of biochemistry and biophysics, Cambridge University, England, will deliver the Abraham Flexner Lectures for 1931 at Vanderbilt University School of Medicine, beginning February 15 and extending over two months. The Flexner Lectures, which are given in alternate years, were established in 1927 by Bernard Flexner, New York attorney, in honor of his brother, Abraham (THE JOURNAL, Jan. 28, 1928, p. 302). Dr. Henrich Poll, director of the Anatomic Institute of Hamburg, Germany, delivered the first series in 1928.

TEXAS

Personal. — Dr. Elliott M. Mendenhall, Dallas, has been awarded the George O. Wilson cup for 1930 for his work in the public schools and with the Dallas Tuberculosis Association; it has been awarded annually for five years to him whose public service during the year is deemed especially notable; this is the first time that a physician has been the recipient..

Bills Introduced.—S. 116 proposes to make it a ground for divorce for either spouse to have been continually confined in any insane asylum for ten years or more. H. 133 proposes to provide for the sexual sterilization of insane, idiot, feebleminded or epileptic inmates of state institutions. H. 6 proposes to require all medical licentiates to register with the board of medical examiners annually and to pay an annual fee of $2. H. 7 proposes to amend the medical practice act by (1) increasing the membership of the board of medical examiners from 11 to 12, (2) requiring that members of the board shall have practiced medicine for three years, instead of the present requirement that members shall have practiced in Texas for three years, (3) requiring all practitioners to register their certificates with the county clerk of each county in which they may practice, and (4) providing a penalty for failure to register certificates in each county in which practitioners may practice.

WASHINGTON

Bills Introduced.—S. 68 proposes that an action of malpractice against a physician and surgeon, an osteopath, a chiropractor, a drugless healer, a dentist or a registered nurse must be started within two years of the alleged malpractice. H. 84 proposes for the issuance by reciprocity of licenses to drugless physicians holding licenses to practice any method of drugless therapeutics in any state in the United States. The term "drugless therapeutics," "sanipractic" and "naturopathy" are stated to be interchangeable terms, defined as follows: "the science and art of advising, directing, applying and prescribing, food science, herbology, psychotherapy, electrotherapy, hydropathy, radiology, physiotherapy, organotherapy, anatomical adjustments, manual and mechanical manipulations, gynecology, obstetrics, or any other natural or mechanical agent for alleviation of disease or trauma to assist nature restore a psychological and physiological interfunction for the purpose of maintaining a normal state of health in mind and body." H. 79 makes it the duty of any hospital, supported wholly or in part by public funds or exempt from taxation, to accept for treatment any patient who applies and to afford to any licensed practitioner of the healing art all the privileges of the hospital customarily furnished to regular practitioners. H. 11, to amend the law that a regular physician or surgeon shall not, without the consent of his patient, be examined in a civil action as to any information acquired in attending such patient necessary to enable him to prescribe for the patient, proposes that if in any civil action the physical condition of the patient is in issue, the patient shall be deemed to have consented to the examination by any physician or surgeon with respect to any information, acquired in attending the patient, which is material to the issue. H. 49, to amend the chiropody practice act, proposes to define the practice of chiropody "as the examination, diagnosis or treatment, medically, mechanically or surgically of the ailments of the human foot and massage in connection therewith; but shall not include the amputation of the toes or foot, nor operation requiring the use of anesthetics other than local."

GENERAL

Society News. — At the annual meeting of the American Society of Tropical Medicine, Cleveland, Dec. 30, 1930, the following officers were elected: Dr. Sidney K. Simon, New Orleans, president; Dr. Frank Smithies, Chicago, and Ernest L. Walker, San Francisco, vice presidents, and Benjamin Schwartz, Ph.D., Washington, D. C., secretary. The next annual meeting will be held in New Orleans in conjunction with the annual session of the Southern Medical Association, November 18-20.

Opportunities for Missionary Service Overseas. — Announcement is made by the American Board of Commissioners for Foreign Missions, Boston, of medical positions, among others, open in overseas service. Men physicians and surgeons are needed, one each at Machemeji, Portuguese East Africa; Bailumdo, West Central Africa; Shaowu, China, and Ahmednagar, India. There is an opening at Ahmednagar, India, for a woman physician and surgeon. There is an opening at each of the following places for a nurse: Sachikela, West Central Africa; Shaowu, China; Fenchow, North China; Ahmednagar, India; Madura, India, and Talas, Turkey.

National Advisory Health Council Appointed.—Members of the National Advisory Health Council, created by act of Congress in April, 1930, as an advisory body to the National Institute of Health, were recently appointed as follows: Dr. Simon Flexner, director, Rockefeller Institute for Medical Research, New York; Dr. Mazyck P. Ravenel, professor of medical bacteriology and preventive medicine, University of Missouri School of Medicine, Columbia; Dr. Milton J. Rosenau, Charles Wilder professor of preventive medicine and hygiene, Harvard University Medical School, Boston; Dr. William H. Welch, Johns Hopkins University, Baltimore; Dr. Waller S. Leathers, dean and professor of preventive medicine and public health, Vanderbilt University, Nashville; Dr. Haven Emerson, professor of public health administration, Columbia University College of Physicians and Surgeons, New York; Samuel C. Lind, Ph.D., head of the department of chemistry, University of Minnesota; Dr. William H. Howell, director and professor of physiology, Johns Hopkins School of Hygiene, Baltimore; Charles-Edward Amory Winslow, D.P.H., professor of public health, Yale University, and Dr. Alfred Stengel, professor of medicine, University of Pennsylvania School of Medicine, Philadelphia.

Medical Bills in Congress.—S. J. Res. 188 has passed the Senate, requesting the "Surgeon General of the United States" to report to Congress (1) the nature and extent of his investigation and survey of conditions in the malarial areas in the United States and (2) whether additional legislation or appropriations are necessary for adequate investigations and surveys looking toward the eradication of malaria in such areas. S. 5465 has been favorably reported to the Senate, proposing to permit degree-conferring institutions incorporated under the laws of the District of Columbia and carrying on their activity exclusively in a foreign country to use in their titles the words "American," "United States," "Federal," etc. H. R. 11212 has passed both the House and Senate, providing a medal and a pension for James C. Burke in recognition of his voluntary act in submitting himself as a subject for experimentations during the malarial fever investigations in the Philippine Islands. S. 5859, introduced by Senator Bratton, New Mexico, proposes further to extend the benefits of hospitalization under the World War Veterans Act to certain veterans of the Spanish-American War, the Philippine insurrection and the Boxer rebellion. S. 5922, introduced (by request) by Senator Brookhart, Iowa, proposes to repeal section 3229, Revised Statutes, relating to the compromising of civil and criminal cases, so far as that section permits the compromise of violations of the narcotic laws. S. 5923, introduced (by request) by Senator Brookhart, Iowa, proposes (1) to require that physicians who prescribe or administer a narcotic shall warn the patients of its habit-forming quality; (2) to prohibit nurses from giving a hypodermic injection of a narcotic drug without the specific written directions of the attending physician; (3) to regulate the filling of narcotic prescriptions, and (4) to provide that the label on each container of medicinal narcotic preparations shall show the kind of narcotic drug in the container and the number of grains in each fluidounce, or in each avoirdupois ounce of solids, as the case may be. H. J. Res. 488, introduced by Representative Clancy, Michigan, proposes to remove the restrictions now imposed on physicians with respect to the prescribing of vinous and spirituous liquor.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 10, 1931.

Conclusions of Committee on Postvaccinal Encephalitis

The occurrence of cases of encephalitis following vaccination and the appointment by the minister of health and the medical research council of a committee on vaccination, under the chairmanship of Sir Humphry Rolleston, to report on the preparation and standardization of lymph, methods of diminishing or removing the risks of vaccination, and the best methods of protection, have been reported in previous letters. The committee found that between October, 1922, and December, 1923, inclusive, sixty-two cases of postvaccinal encephalitis were reported, though few were proved by microscopic examination. This would amount to one case in 16,903 vaccinations. About half of those affected died, but the others usually recovered completely. The committee recommended that the officially advocated four insertions for vaccination be reduced to one, with a minimum of trauma, and deprecated multiple scarification. This recommendation was adopted by the minister of health in an order issued by him. The committee has now issued a further report containing a record of ninety subsequent cases brought to its notice, and its final conclusions, which, as far as this country is concerned, are the last word on the subject. It finds that an acute nervous disease with a mortality of nearly 50 per cent continues intermittently to appear now here and now there with manifest disregard to the incidence of any known factor other than vaccinia. It is associated with characteristic changes in the brain and cord similar to those found in the acute nervous conditions occasionally following influenza, measles and variola. Like them, it is dependent on a precedent infection but differs in that it follows the infection with great regularity within a definite limit of time. Although no particular lymph can be incriminated, it is clearly the vaccine virus, whatever its past history and in whatever medium incorporated, that initiates the nervous disturbance; but why this should be almost limited to a few individuals of a particular age group (the disease is relatively rare in infants under 1 year) is not known. The grouping of cases in place and time and the tendency to familial incidence are striking features and point, in the committee's opinion, to the existence of some local individual predisposition in the widest sense of that term.

Advisory Committee on Nutrition

The minister of health has made a new departure by appointing a committee to advise him on the practical application of modern advances in the knowledge of nutrition. The committee consists of eminent dietitians: Sir F. Gowland Hopkins, F.R.S., professor of biochemistry in the University of Cambridge; Dr. E. P. Cathcart, F.R.S., professor of physiologic chemistry in the University of Glasgow; Dr. Edward Mellanby, F.R.S., professor of pharmacology in the University of Sheffield. The chairman is Dr. Major Greenwood, F.R.S., professor of epidemiology and vital statistics in the University of London. The members will hold office until December, 1933, and will be eligible for reelection.

An Institute of Surgical Research

Plans are being prepared for the establishment of an institute of surgical research for Great Britain. The proposed site is Downe House Estate in Kent, once the residence of Charles Darwin, which a retired genito-urinary surgeon, Mr. G. Buckstone Browne, bought and handed over to the British Association with the intention that Darwin's home would be preserved as a permanent memorial and museum. The idea of an institute of surgical research is due to Lord Moynihan, president of the Royal College of Surgeons. His proposal is that the Royal College of Surgeons should become lessee of part of the land and set up a research station, which he has had long in mind. The plans are a continuation of a policy which the College of Surgeons has decided on. The college already has a vast museum, of which John Hunter's collection is the nucleus. Three years ago the council determined that this was not enough and that facilities should be provided for laboratory research, which was then begun at the college. Three scholarships were founded and three scholars were appointed, who are young men attached to London hospitals, with the hope of ultimately being placed on the staff. The institute at Downe House will greatly increase the facilities for research work. It will have an area of ground of 5 acres. There will be seven unit blocks of laboratory buildings with stabling. Each unit will contain a workroom with a floor area of about 3,700 square feet, arranged on two floors. The workrooms will accommodate two principals, two assistants and six attendants.

The Treatment of Leprosy

The British Empire Leprosy Relief Association is an organization for combating leprosy in the British Empire both by research and by propaganda. A large part of its fifth annual report, for 1929, which has just been published, is devoted to India, where, according to the census for 1921, there were 102,513 lepers. But subsequent surveys by experts place the figure at four or five times this. Dr. Ernest Muir, research worker in leprosy, School of Tropical Medicine, Calcutta, who is a well known authority on the disease and in a special position to pronounce on the latest therapeutic measures, describes his experience. He gives first place to creosoted hydnocarpus oil and its esters, which he finds to be the most useful and economical preparation and also painless. Sodium hydnocarpate, which was so strongly recommended by Sir Leonard Rogers, he has found apt to cause endophlebitis when injected intravenously. He therefore suggests a technic for avoiding this. Sodium hydnocarpate is convenient in such countries as Africa, where hydnocarpus trees are not yet available, as it occupies little room and can be conveniently imported.

Smoke Abatement

Realizing the need of a clearer definition of what constitutes a smoke nuisance, the ministry of health has invited the department of scientific and industrial research to supply information on the use of optical methods for estimating the emissions from industrial chimneys. The department has responded by developing experimental work already in progress. Experiments, previously confined to one type of boiler, will now be extended to other types and to methods of firing. The opacity of smoke depends on a number of variables—the total concentration, size and color of the particles and the way light falls on them. Notwithstanding this theoretical difficulty, a close relation has been found in the one type of boiler between the opacity and the density of the smoke. Other types of boilers will be studied to see whether, with greater range of variables, the same empiric relation holds. A hopeful result already attained is the extent to which the amount of tar in the smoke affects its opacity. This, it is thought, may prove a simple basis for differentiating between smoke that constitutes a legal nuisance and smoke that does not. Although the experiments may be unsuccessful in their primary object of establishing an optical method of measuring the density of smoke, they will probably yield valuable results in the problem of controlling the efficiency of fuel combustion. Thus it should be simple to arrange for the automatic control of mechanically stoked furnaces by fixing an optical measuring apparatus in the chimney designed to regulate the rate of feeding of fuel, as well as the draft, according to the amount of solid matter in the flue gases. This would have the advantage of dispensing with special observation of the smoke issuing from the chimney. The investigations show that this would be practicable for individual boilers.

PARIS

(From Our Regular Correspondent)

Dec. 31, 1930.

Cancer and Magnesium in the Soil

Professor Delbet is carrying on research on the relation that he alleges exists between the dearth of magnesium in the soil and the development of cancer. He stimulates research by other investigators and publishes results that appear to confirm his thesis. He presented recently to the Academy of Medicine the results of the research of Dr. Robinet of Moret. The latter prepared statistics on cancer mortality in the small rural communes with less than 5,000 inhabitants, who live directly from the soil. He then made investigations to determine the magnesium content of the French soil. He presented two maps, one showing the distribution of magnesium and the other the relative incidence of cancer. The relationship between the two maps is striking. Of the twenty-five districts with a very low cancer incidence, twenty-four have a soil with a high magnesium content. Of the twenty-four districts having the most cancer, twenty-three have no magnesium. Continuing his research, Robinet prepared two maps of the distribution of magnesium and the incidence of cancer in Alsace-Lorraine. They confirm the results of the comparison of the two maps of France. The departments of Haut-Rhin and Bas-Rhin have a high cancer incidence (coefficient 9.2 and 9.6) and their soil has but little magnesium. In the department of Moselle, in which there is not half as much cancer (coefficient 4), there are everywhere strata with a high content of magnesium.

Toxicity of the Blood Serum in Epilepsy

Experiments that Dr. Pagniez has reported to the Société de biologie have confirmed the existence of a toxic substance in the blood of patients with epilepsy coincident with attacks. The serum of such blood, injected directly into the carotid artery of guinea-pigs, produces in them almost immediately violent myoclonic shocks. Mr. Pagniez assured himself that this action was independent of the phenomena of shock ascribable to the injection of human blood of any kind, and that it is not the consequence of changes occurring in the serum in vitro, for the effect is manifested as soon as the serum is collected and injected. This toxin that exists in the blood plasma is rapidly isolated by centrifugation in frozen paraffined tubes. It does not appear that there are any apparent relations between the degree of myoclonic action of the serum and the imminence in the patient of a paroxysmal attack. The comparative study of the serum before and after the test of the hyperpnea does not enable one to note any differences as to the myoclonic action. The cerebrospinal fluid is rarely myoclonic (two times in eleven cases), but when it is it is highly so.

Broadcasting Courses of the Faculties of Medicine

Requests have come from physicians that the courses of the Faculté de médecine be broadcast in order that students, prevented by other occupations from attending, might profit by them. For many reasons the requests have been unanimously rejected by the professors. Broadcasting is done usually during the evening hours, after the lectures have been given. The instruction in the classroom is not confined to the discourse of the instructor but includes indispensably the presentation of specimens, drawings, charts, lantern slides and films, and, finally, the execution of experiments or demonstrations, which could not be broadcast. The student who cannot attend the courses would accordingly profit more from the reading of a well illustrated book. There are other drawbacks even more serious. If the students could carry on their studies by radio, in their own rooms, they would no longer attend the courses of the Faculté. Furthermore, the broadcasting of lectures would reach not only the students but also the general public. But the courses of the Faculté are not public. Only such persons as have taken out matriculation cards are permitted to attend. It is not advisable that the public hear lectures that many persons would not fully understand. Some might draw false interpretations, which might be harmful to those who risked making practical application to themselves.

Increased Budget of Public Welfare Department

The budget of the Administration parisienne de l'Assistance publique, in which are included the expenditures for the hospitals, has been fixed, for the year 1931, at 602,761,607 francs ($24,110,000), an increase of more than 43,000,000 francs over the budget of 1930. The part contributed by the city of Paris is 256,000,000 francs ($10,240,000), an increase of $780,000 over 1930. The Assistance publique dé Paris has at present 40,030 beds in the hospitals, hostels and the large foundations. The chairman of the budgetary committee anticipatés that, in 1931, the Assistance publique will have occasion to provide for a total of 13,176,628 days of illness, or nearly 340,000 days more than in 1930, which signifies that 363,000 patients and wards will be taken care of in the hospitals and hostels.

Court Decision Concerning Football in Schools

The character of the games permitted, during recreation periods, on the playgrounds of educational institutions is of interest to parents. The court of appeals of Paris was recently called on to render a decision in the matter of football. The principal of a school had permitted the organization of a football game on the playgrounds. In the course of the game, a youth was thrown to the ground and one foot was badly injured. Considering the principal responsible for the accident, the father of the injured lad brought suit for damages before the court of appeals. The court sustained the demand of the father, basing the decision on these considerations: "Rugby football is a violent, and even dangerous, form of exercise that should not be indulged in, during a simple recreation period, on grounds that have not been expressly prepared for the purpose, and without the explicit consent of the parents." The decision of the court was, then, to the effect that rugby football is a sport that pupils should not be permitted to enter into other than on grounds especially prepared, and then only in case parents accept the risks; it is not to be regarded as a form of physical exercise for pupils to participate in, at will, anywhere on the grounds of the institution, since such exercises imply a surveillance and an accountability on the part of the school principal.

BERLIN

(From Our Regular Correspondent)

Dec. 29, 1930.

Use of Mice in Buildings as Cancer Indicators

In the *Deutsche medizinische Wochenschrift*, a peculiar suggestion is made by Professor Teutschlaender of Heidelberg for the identification of "cancer houses"; that is to say, buildings residence in which is regarded (whether rightly or wrongly) as likely to produce cancer. A gray mouse was brought to him that was caught in a building used for the manufacture of coal dust briquettes, and which was found to have tumors that, on examination, proved to be so-called pitch cancer. That the tumors had been caused by pitch dust was revealed by the fact that this irritant was found in the fur and also in the tumors. As the mouse acquired its tumors through having taken up its permanent abode in the briquette factory, the term "cancer house" is applicable; furthermore, the danger arose through the deposits of pitch dust found everywhere, just as cancerous rats have been found in a Copenhagen sugar refinery. This serves to show how such "cancer houses" may originate and that there is no need of suspecting the transmission of an infection by a cancerigenic organism. "We must consider," the author continues, "that the mouse reacts to the pitch dust or other cancerigenic irritations (if exposed regularly), in a few months, with cancer, whereas man does not present irritation cancers until after the lapse of several years. Thus, the mouse, owing to

its quicker reaction, appears suitable to give warning of the existence of such a danger before any danger would exist for the workmen employed in a factory or for the inmates of a house. Hence, the proposal to put cages of white mice in exposed places in newly erected industrial plants, especially in those in which gaseous or dust-producing substances are used, and also in plants in which protective measures against such occupational injuries are already installed. If the mice develop symptoms of illness, they would be sent to laboratories for examination. In plants of a newer type, the mice, by their symptoms of illness, might give warning of the presence of a substance to be combated or avoided, and also of the mode of its action, and thus would furnish indications for the protective measures to be adopted. In plants in which protective measures have been already installed, they would furnish evidence as to the value or the reliability of such measures or as to the necessity of improvements."

Later Developments in the Lübeck Disaster

So far as is known, seventy-three children have died, thus far, from ingestion tuberculosis. In addition, seven children are said to be hopelessly ill, while thirty are moderately ill, and seventy-five are slightly ill. It is, of course, too early to say whether or not, as the children develop, further injuries will become manifest. The Lübeck senate has assured the parents that it will compensate them for all the damage that may result, directly or indirectly, from the infection. But the majority of the parents are not satisfied with this assurance alone. They demand that, in addition to the granting of compensation, the persons who were responsible for the error be punished. The trial of the persons concerned will be begun soon.

New Home of Institute for Brain Research

In Buch, near Berlin, there rises, on the southern edge of the large group of buildings composing the psychopathic hospital, a plain, four-story, white structure, the new home of the institute for brain research, founded in 1915 by the Kaiser-Wilhelm-Gesellschaft. The institute is under the direction of Prof. Oskar Vogt, who is assisted by his accomplished wife Cécile. A clinic containing forty-eight beds, and constituting an annex of the institute, is under construction. According to the statements of Vogt, brain research deals not only with the structure and the functions of the human brain but also with the exploration of the most conspicuous human defects and the most eminent human perfections. Normal endowment, mental disease, inferiority of every kind, but likewise superiority rising to genius, have their material bases, and find their visible expression, in peculiarities of the anatomy of the central nervous system. Scientists today divide the cerebral cortex into 200 parts differing distinctly in their structure, and recognize in these divisions complex gages of depth in the arrangement of the tissues. Investigators have discovered that the human brain is not simply one single mass, as is essentially the brain of the ape, but gives evidence of differentiation and division into several distinct parts. Brain sections of weak-minded murderers, of normal persons and of persons with high intellectual endowments have been placed side by side and compared, and in the parts that are the chief centers of intellectual activity marked variations in structure could be demonstrated. The institute proposes to develop research in this direction. The ultimate goal is the discovery of methods of preventing and combating mental disease; likewise, demonstration of the hereditary process that leads to higher and to lower mental development is sought.

Research in Criminal Biology

The Kriminalbiologische Gesellschaft, founded three years ago, by Professor Lenz of Graz, to carry on research on the personality of criminals, met recently in Munich. In Bavaria, prison physicians, prison chaplains, teachers, and specially trained prison officials, are making an intimate study of the personality of prisoners soon after their admission to prison and are securing detailed information from the authorities of each prisoner's home region. The observations thus obtained aid, in individual cases of penitentiary management, in reaching a practical decision as to whether or not a given criminal is corrigible and hence a proper subject for the application of the modern form of progressive punishment in stages. These observations constitute also valuable material for scientific investigations. According to the reports on some 7,000 persons, more than half of all the prisoners are practically incorrigible. Professor Rüdin, in reporting on his hereditobiologic researches, states that thus far he has found no evidence of hereditary transmission of pronounced criminal tendencies but that his investigations do point to certain conditions of weakmindedness that, through several generations, may lead to secondary criminality. Professor Lenz demanded an extensive consideration of the personality of evildoers in criminal procedure, and, especially, the consideration of criminobiologic disabilities, before the imposition of penalties. He criticizes severely certain quick-action courts, by reason of the inadequate consideration given to the personality of the defendant. Privatdozent Hans v. Hentig of Giessen attacked the onesidedness of the two theories of the "born criminal" and the influence of "evil environment." He considers crime as due to the coincidence of criminal personal tendencies and unfavorable external circumstances, among which paramount importance must be attached to the social milieu. The audience voiced its approval when v. Hentig emphasized that, in addition to true criminality that traces its origin to these two ineradicable roots, there is an artificial criminality that owes its existence to improper federal legislation. The legislators have imposed, without adequate reason, severe penalties on a number of indifferent acts. This evil is growing from year to year. Thus the German *reich*, during the past fourteen years, has increased the number of its severe penalties for crime by 40 per cent. The departments of the federal government constantly provoke, by unwise procedures, violations of the penal laws, which explains the immense number of sentences imposed for perjury and for resistance to federal authority.

NETHERLANDS

(From Our Regular Correspondent)

Dec. 15, 1930.

Tuberculosis in School Children

In previous letters, attention was called to the antituberculosis crusade in the Netherlands, and particularly to tuberculosis in the schools. Madame Christine Bader has recently published in the *Bulletin international de protection de l'enfance* a comprehensive statistical report from which it appears that, in the Netherlands, the mortality from tuberculosis is the lowest during school age. The statistics on the morbidity from tuberculosis are, however, entirely different. According to the annual reports of the district bureaus and of the inspection service of child hygiene, the number of patients is as follows:

	Pulmonary Tuberculosis	Cerebral Tuberculosis	Other Forms of Tuberculosis
Under 1 year	16	5	11
1 to 4 years	268	28	69
5 to 14 years	1,387	17	287
15 to 19 years	1,017	3	90
20 to 29 years	2,462	2	149
30 to 39 years	1,408	0	36
40 to 49 years	691	1	36
50 to 59 years	266	0	14
60 to 79 years	114	1	11

As may be seen, the ten years covered by the school age show the second largest number of cases of tuberculosis (20 per cent). The 20-29 age groups reveal the highest incidence (30 per cent). Furthermore, the consultation centers report the skin reactions to tuberculin as positive in 45 per cent of the cases in the

5-6 age groups, 52 per cent in the 7-10 age groups, and 60 per cent in the 11-14 age groups. Tuberculosis is therefore a disease of which serious account should be taken during the school age. The child should be protected against contagion. In the Netherlands the protection of childhood is in the hands of private organizations subsidized by the government, the province and the commune. Medical inspection of schools exists only in the large cities, where the municipal administration appoints the medical inspectors. The placement of school children in school colonies, which is an excellent means of improving the health of the child, is much in vogue. In 1928, the school colonies accommodated 20,221 children. The number of days in which such care was given totaled 707,742. In addition, 2,806 children are placed in private families. It should be emphasized, however, that the selection of children to be placed in families should be made with the greatest care. The school colonies are neither hospitals nor sanatoriums. Children who are already ill should be eliminated. The pupils that should be supervised with great care are those coming from families in which there are tuberculous persons, for they have had repeated contacts. Such children are subject to periodic control by the chief physicians of the consultation centers of the district. But it would be well if there were cooperation between the tuberculosis specialist and the specialist in diseases of children.

Two Strains of Anopheles Maculipennis

From studies carried out by Drs. A. de Buck, E. Schoute and N. H. Swellengrebel, and published in the *Rivista di malariologia*, it appears that there are strains of *Anopheles maculipennis* that behave differently in the transmission of malaria. The authors have shown that there are in the Netherlands strains of *Anopheles maculipennis* that differ essentially in their morphologic characters and species that are fixed in their hereditary types. One variety, with short wings, is encountered with greater frequency in malarial regions. During the autumn, among the insects of this species, there develops an adipose body of short dimensions. The mosquito lives in captivity and several generations are easily grown. The other variety, with long wings, is found chiefly in the regions without malaria. In these insects, during the autumn, there forms an adipose body of relatively immense size, which seems to be connected with a plant on which it feeds. The individuals of this variety remain inactive during the winter, even in a warm environment. It becomes then incapable of transmitting experimental malaria.

Congress on the Regulation of Public Health

The thirty-fourth Congrès de la réglementation de la santé publique held recently its sessions in Middelburg. A paper was presented by Mr. P. J. Kallen on the subject of "The Rôle of Health Commissions." Mr. Wiertsema discussed "Relations Between Health Commissions, on the One Hand, and the Mayors and Lawyers." From these discussions it appeared how great is the number of insanitary dwellings still occupied, and how indifferent the public authorities are to the earnest and sustained efforts of the sanitary commission. Following the papers, a resolution was passed requesting a closer collaboration between the inspection department of public hygiene and the sanitary commission. Dr. J. Jitta presented an interesting paper on the subject of the fruitful results to be obtained from a close collaboration between the physician and the veterinarian in the study of certain diseases due to micro-organisms. Miss Sievertsen Buvig and Dr. Wysenbeek considered the topic "The Social Task of the Midwife and of the Physician Before and After the Birth of the Child." The midwife would like to see her field of action enlarged. That view was vigorously combated, but as regards the care to be given to infants the visiting nurse was judged more capable. A closer collaboration between the physician and the midwife is, however, desirable. The congress considered likewise the problem of the future organization of social hygiene. While no final form of organization was approved, the congress seemed to favor the creation of district sanitary services.

Death of Prof. Dr. H. Zwaardemaker

September 19 witnessed the passing of Dr. H. Zwaardemaker, after a scientific career characterized by devotion to the welfare of humanity. After serving for a time as an army physician, he took up the study of diseases of the nose, throat and ear. He published his research in a book entitled "The Physiology of the Sense of Smell." Succeeding Prof. T. W. Engelmann, in 1897, at the University of Utrecht, he was able to devote himself entirely to the study of his favorite subjects. In 1905, in collaboration with Burger, he published a work entitled "Leerboek der Oorheelkunde" (treatise on otology). He developed new theories on the subject of audition based on the pressure of sound waves on the organ of Corti, and finally he gave attention to the control of devices for the aid of hearing. He concluded from his experiments that such devices have the common defect of reenforcing without distinction all the sounds, whereas it is a question of reenforcing the sounds that the patient hears less well. While he did not solve the problem of the audiphone, he brought it much nearer to solution.

Treatment of Leprosy by Irradiation

Dr. Mulder reported recently on the treatment of leprosy by means of irradiation. Although the results secured thus far are not sufficient to base thereon precise and definite conclusions, it is nevertheless evident that this form of treatment has given positive results making for recovery. No doubt the experiments will be taken up again under more favorable conditions, which will make it possible to place a more exact estimate on the value of light treatment in leprosy.

ITALY

(From Our Regular Correspondent)

Nov. 30, 1930.

The Congress of Surgery

The Società italiana di chirurgia held recently its thirty-seventh annual session at the Policlinico Umberto I in Rome, under the chairmanship of Prof. Roberto Alessandri, clinical surgeon of the University of Rome.

TREATMENT OF CRANIOCEREBRAL TRAUMAS

The discussion on "The Treatment of Craniocerebral Traumas" was divided into three parts. The official paper on the first part was presented by Prof. Guido Egidi of Rome, the speaker for the Società italiana di chirurgia. Part 2 was discussed by Dr. Corradino Giacobbe, a captain in the army medical corps, the speaker for the army. Part 3 was considered by Prof. O. Alberti of Brescia and Dr. Mascherpa of Milan, speakers for the Società di radiologia medica.

Professor Egidi explained the treatment of traumatic craniocerebral lesions, exclusive of those produced by firearms. The speaker distinguished lesions of the cranium from those of the brain. The treatment of fractures of the cranium requires, as does treatment of any fracture, the reduction and the coaptation of the fragments. The coaptation, in these cases, requires no particular care, for the fragments, once reduced, do not show any tendency to spread apart. To secure the reduction of the fragments in case of subcutaneous injuries, it is necessary to transform a closed fracture into an open one. Concerning the need of such an intervention, to be carried out systematically, the majority of surgeons are now agreed.

The treatment of exposed fractures varies with the length of time that has elapsed and the condition of the lesion. Particularly, infected wounds require open treatment. In those that are not infected it is permissible to attempt a reunion, partial or total. In fractures of the base of the cranium a treatment corresponding to that of exposed fractures of the dome is not applicable. Such fractures are seriously exposed to infection,

the prophylaxis of which, by means of antiseptic lavages of the meatus auditorius and of the nose, is useless.

In the treatment of intracranial hematomas, the first problem is the diagnosis. Of great aid in the diagnosis are: spinal puncture, cranial puncture and radiographic examination after filling with gas the subdural and ventricular spaces.

The gas (air) may be injected directly into the lateral ventricles or through a lumbar puncture. Ventriculography and encephalography may be done. The diagnosis of intracranial hematoma being established, either cranial (aspiratory) therapeutic puncture or craniotomy may be performed. As regards the latter, it will be recalled that now osteoplastic resection is preferred to ordinary trephination. The speaker explained then the criteria to be followed in the treatment of cerebral compression, and described the various methods of decompression, both medical (atropine, intravenous injections of hypertonic solutions) and surgical (lumbar puncture, cranial puncture, trephination of the cranium).

Dr. Giacobbe explained the treatment of craniocerebral traumas, excluding those caused by firearms, in military medicine. The speaker considered 257 cases of cranial trauma treated in the military hospitals during the past ten years. In the army, craniocerebral lesions not resulting from firearms constitute about 1 per cent of the total number of traumatic lesions. Traumatisms caused by a fall from a horse, by the kick of a horse or other animal, and the accidents due to aviation, predominate. The first treatment is direct, in order to overcome the state of shock, and for that purpose the infirmary of the army corps and the infirmary of the aviation field, and also the troops on the march or engaged in maneuvers, are furnished with suitable equipment. When the first shock has been overcome, the regimental surgeon, after providing for the protection of possible wounds by means of aseptic substances, has the patient taken to the hospital, where the curative treatment proper is begun. In simple commotio cerebri without fracture, symptomatic treatment is employed. In only two cases was lumbar puncture resorted to, which was followed by rapid improvement of the persistent headache. In exposed fractures of the dome, surgical intervention was always applied, the results of which were in direct relation to the promptness with which it was instituted. In closed fractures of the dome, whether deep-lying or comminute, early intervention was employed, an exception being made in the mild deep-lying cases, especially if the focus corresponded to a mute cerebral zone, and when there were no symptoms of increased pressure. In the fractures of the base of the cranium, lumbar puncture was the treatment of choice. Subtemporal trephination was no longer performed. The infectious complications proved to be especially grave. Every time meningo-encephalitis developed, the outcome was fatal. In the series of 257 cases observed, there were forty-four deaths, or 17 per cent. Twenty-one of the deaths occurred during the first thirty-six hours. It should be noted, however, that nearly all these traumatizations present also grave thoracic and abdominal lesions (aviation accidents). In the other 213 cases, the recent outcomes may be regarded as good. Often the headaches and the attacks of dizziness have been very resistant. In a single case there developed as a sequel jacksonian epilepsy, which cleared up after a second direct intervention to remove the cicatricial adhesions and repair the loss of bone substance.

Professor Alberti and Dr. Mascherpa discussed the value of radiology in the management of craniocerebral traumas. The speakers reviewed the various types of fracture, both of the dome and of the base of the cranium, illustrating the various radiologic manifestations and explaining the special technic required to bring out the several regions. They studied then the various causes that may lead to errors of interpretation and set up the differential diagnostic criteria. They described, in turn, the possible radiologic manifestations in the field of traumatic cerebral lesions, dwelling more particularly on the use of encephalography in craniocerebral traumatisms. On this technic the speakers had a personal series of 300 cases, of which they explained the more important features. They discussed also another series of cases pertaining to the radiologic behavior of cranioplastic operations, especially in their remote results, and reached the conclusion that, whereas cranial injuries left to themselves almost never fill up with bone tissue, an osteoplastic graft obtained from the same cranial wall fits the purpose very well. However, an osteoplastic graft taken from the same person (omoplasty) but from a distant region, especially the tibia, did not prove satisfactory.

Numerous communications in addition to the official papers were presented. During the discussion, Rossi, clinical surgeon of Milan, emphasized that the first impression gained from the papers and communications presented is the gravity of the craniocerebral lesions. They still have an average mortality bordering on 60 per cent. The speaker declared himself opposed to preventive craniotomies, as they are dangerous for the patient. He favors the tendency to treat fractures of the base of the cranium solely by lumbar puncture; he approves also dehydrating therapy, as it is devoid of danger. He called attention also to the value, for the diagnosis, of stereoscopic radiography.

Donati, clinical surgeon of Turin, expressed the view that no distinction can be made between the surgery of war and the surgery of peace; the former, contrary to the belief of some, is more grave than the latter. He considers it advisable to use lumbar puncture extensively, as it is harmless and often beneficial. If in posttraumatic epilepsy it becomes necessary to intervene surgically, flap craniotomy should be performed with simple trephination. He spoke of the frequency of posttraumatic serous cysts that develop from hematomas.

Gamberini of Bologna reported his personal statistics extending over a period of nine years. In 132 cases of commotio cerebri, he had observed sixteen deaths. In fifty-nine fractures of the cranial dome there were ten deaths, and forty-one deaths in seventy-four fractures of the base of the cranium. For the past two years he has performed systematically necropsies in all fatal cases and has always found such grave lesions that no type of intervention would have saved the patient's life.

Alessandri, clinical surgeon of Rome, expatiated on a number of points concerning which no agreement has as yet been reached by the various surgeons. In the case of cavities without lesions of the soft parts, he considers intervention necessary. In fractures of the base of the cranium there are cases in which there is nothing to be done, but in many cases improvement and even recovery can be effected by means of lumbar puncture. In some cases cerebral puncture may be useful, and if the results are good, decompression and evacuation may be indicated. As to ventriculography and encephalography, he considers that they are rarely applicable in cases of recent trauma and should always be employed with great caution.

HEMATURIA

The second topic on the program, "Hematuria," was discussed in collaboration with the Società di medicina interna, and in a previous letter the papers presented by the internists were considered. The surgical side was presented by Prof. Giovanni Battista Lasio of Milan. The speaker emphasized that, if there is blood in the urine, the diagnosis should be extended to the following fundamental inquiries: (1) whether true hematuria exists or whether it is a question of hemoglobinuria; (2) what the urinary organ is that is the seat of the hemorrhage, and (3) what the lesions of this organ are and whether the lesions are the expression of a primary lesion of the same organ or are secondary to other infections. In the surgical forms of hematuria, the relation of cause and effect between lesion and hemorrhage is easily ascertainable. Of the mechanical factors, calculus constitutes a typical example, not only for its mobilization but also on account of the lesions of septic calculitis, which may give rise to hematuria.

Congestion, disturbances of the renal circulation and renal infarct may be causes of hematuria. Hematuria may be also of a hypertonic nature or may have its cause in a hemorrhagic diathesis, the most frequent form of which is purpura. As regards hematuria in the child, on the basis of the theory of Auricchio it may be concluded that all the urinary pathologic changes of the adult may be observed also in the child, and to the child may be applied also the same etiologic and diagnostic criteria. There are, however, special conditions associated with heredity (syphilis), with the development and with the pathology of the development, that may give rise to a hematuria that will remain obscure in relation to its pathogenesis and to the anatomopathologic substratum. Hematuria may occur also in types of glomerulonephritis of toxic origin. Such forms of nephritis are due to the streptococcus and pneumococcus, to lead poisoning or to mercuric chloride, and to acute fulminating pyelonephritis, due to the penetration of the kidney, by way of the circulation, by septic emboli from other foci. The treatment of hematuria must be directed more to the symptoms than to the disease. Operative treatment must be regarded as essential. It may be of a strictly medical character or of a surgical but bloodless type, as in drainage, electrocoagulation, lavages and tamponing of the bladder. For hemostasis, serum is widely used and rarely has unfavorable results. Gelatin by the intramuscular route is contraindicated in nephritis patients, owing to the danger of albuminuria.

Many nonofficial communications were presented to the congress. Professor Fichera of Pavia spoke on the correction of the oncogenic disequilibrium, and of certain tests that he has devised for the determination of the antineoplastic cytoregulation. The speaker has succeeded in identifying certain organs (thymus, spleen) that possess a regulatory control of cellular proliferations, by means of which it is possible to impede the gradual transformation of cells into tumoral elements, and likewise to arrest the later evolution of the disease. Attempts to apply biologic therapy to malignant tumors, begun by the speaker on the basis of the conceptions already explained, have given, thus far, encouraging results. Donati of Turin demonstrated with the use of animals an instrument of his own invention for the closure and suture of the duodenum.

Bari was selected as the meeting place for the next congress. Professor Righetti was elected chairman of the committee on organization. The following topics will be on the program: (1) Syndromes Associated with the Right Side of the Abdomen, and (2) Pancreatitis (in collaboration with the Società di medicina interna). A topic was likewise selected for the Congress of Surgery to be held in 1932; namely, "Treatment of Bronchiectasis."

Marriages

RUSSELL A. MILLAR, Brooklyn, to Miss Mary Ellen Murnane of Plattsburg, N. Y., Dec. 29, 1930.

FREDERICK WESTCOTT SOLLEY to Miss Dorothy Van Heusen Bates, both of New York, January 10.

COLDEN RHIND BATTEY, Augusta, Ga., to Miss Nell Duncan Jenkins of Beaufort, S. C., January 3.

LINN FENIMORE COOPER, Baltimore, to Miss Eleanor Pickels of Catonsville, Md., Dec. 29, 1930.

SAMUEL O. FREEDLANDER, Cleveland, to Miss Adeline Kaden of New York, January 5.

THOMAS FRANCIS HOWLEY to Miss Viola Catherine Dooling, both of New York, January 7.

GEORGE R. LEONARD to Mrs. Mary Perkins Burgess, both of Chicago, Dec. 31, 1930.

FRANCIS E. BELL, Ludlow, Ky., to Miss Grace Brewer of Louisville, Dec. 25, 1930.

MORTON K. HERTZ to Miss Selma Y. Rosenthal, both of New York, January 21.

EDGAR M. ICKES to Miss Charlotte E. Dillon, both of Fremont, Ohio, January 9.

Deaths

Hiram Woods ⊕ Baltimore; University of Maryland School of Medicine, Baltimore, 1882; member of the House of Delegates of the American Medical Association in 1912 and chairman of the Section on Ophthalmology, 1912-1913; emeritus professor of ophthalmology and otology at his alma mater; councilor and past president of the Medical and Chirurgical Faculty of Maryland; member and past president of the American Ophthalmological Society; member of the American Academy of Ophthalmology and Oto-Laryngology and the American College of Surgeons; aged 73; on the staffs of the Hospital for Crippled Children, Hospital for Women of Maryland, Sheppard and Enoch Pratt Hospital, and the Union Memorial Hospital, where he died, January 15, of pneumonia.

Edgar Steiner Thomson ⊕ New York; University of Pennsylvania School of Medicine, Philadelphia, 1893; Secretary of the Section on Ophthalmology, American Medical Association, 1910-1912; member of the American Ophthalmological Society; served during the World War; surgeon director of the Manhattan Eye, Ear and Throat Hospital; on the staffs of the New York Babies' Hospital and the Bronx Eye and Ear Infirmary, New York, Englewood (N. J.) Hospital, Perth Amboy (N. J.) Hospital, and Ossining (N. Y.) Hospital; aged 59; died, January 12, of cerebral thrombosis.

Francis Anderson Winter ⊕ Brigadier General, U. S. Army, retired, Washington, D. C.; St. Louis Medical College, 1889; entered the Army as assistant surgeon in 1892; served in the Spanish-American War; awarded distinguished service medal for service overseas during the World War; was retired in 1922, at his own request after thirty years' service; member of the American College of Surgeons; aged 63; died, January 11, in the Walter Reed General Hospital, of arteriosclerosis, chronic nephritis and uremia.

Emdon Fritz ⊕ Manchester, N. H.; Bellevue Hospital Medical College, New York, 1880; member of the American College of Surgeons; past president of the New Hampshire Medical Society; formerly on the staff of the Sacred Heart Hospital; aged 76; died, January 11, of prostate obstruction and hemorrhage of the bowel.

Rufus Leonidas Allen ⊕ Waynesville, N. C.; University of Maryland School of Medicine, Baltimore, 1885; past president of the Haywood County Medical Society; formerly county superintendent of health and coroner; on the staff of the Haywood County Hospital; aged 66; died, January 8, of cardiovascular renal disease.

James Evan Shuttleworth, Jr., Richmond Hill, N. Y.; New York Homeopathic Medical College and Hospital, 1904; member of the Medical Society of the State of New York; aged 52; was drowned, Dec. 26, 1930, when he jumped overboard from the ocean liner *Franconia.*

Will Henry Whitslar, Cleveland; Rush Medical College, Chicago, 1886; member of the Ohio State Medical Association; also a dentist; emeritus professor of operative dentistry and professor of dental history and ethics, Western Reserve University; aged 68; died, in December, 1930.

Stuart Clarke Johnson ⊕ Washington, D. C.; Georgetown University School of Medicine, Washington, 1897; served during the World War; formerly on the staff of the Georgetown Hospital; aged 56; died, January 7, in the Garfield Hospital, of cerebral hemorrhage.

Francis Arthur McCullough, Mansfield, Ohio; Ohio State University College of Medicine, Columbus, 1914; member of the Ohio State Medical Association; on the staff of the Mansfield General Hospital; aged 44; died, January 3, of uremia and hypostatic pneumonia.

Chauncey Mortimer Rakestraw, Red Springs, N. C.; Medical College of Ohio, Cincinnati, 1894; member of the West Virginia State Medical Association and the American College of Surgeons; aged 58; died, January 10, as the result of a cerebral hemorrhage.

Edson Christopher Brown, Mansfield, Ohio; Ohio Medical University, Columbus, 1900; member of the Ohio State Medical Association; formerly superintendent of the Massillon (Ohio) State Hospital; aged 54; died, January 10, of bronchopneumonia.

Frank A. Thompson, Philadelphia; Temple University School of Medicine, Philadelphia, 1914; professor of pathology

⊕ Indicates "Fellow" of the American Medical Association.

and dean of the School of Chiropody, Temple University; aged 55; died, January 10, in the Philadelphia General Hospital, of heart disease.

Frederick McKelvey Bell ⊕ New York; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1903; served during the World War; aged 52; on the staff of the New York Polyclinic Medical School and Hospital, where he died, January 6.

Clarence Ray Williams, Wills Point, Texas; Medical Department of the Tulane University of Louisiana, New Orleans, 1908; member of the State Medical Association of Texas; aged 48; died, Nov. 17, 1930, of cerebral hemorrhage.

George W. Neff, Masontown, Pa.; Jefferson Medical College of Philadelphia, 1870; formerly member of the state legislature; veteran of the Spanish-American War; aged 84; died, Dec. 16, 1930, in the Uniontown (Pa.) Hospital, of pneumonia.

Llewellyn Ludwig Duggar, Mobile, Ala.; Medical Department of the University of Alabama, Mobile, 1898; member of the Medical Association of the State of Alabama; formerly county coroner; aged 54; died, January 10, of pneumonia.

Era M. Scofield, Jamestown, N. Y.; University of Buffalo School of Medicine, 1884; member of the Medical Society of the State of New York; on the staff of the Jamestown General Hospital; aged 74; died, Dec. 25, 1930, of heart disease.

Frederick Davis Patterson, Cuthbert, Ga.; Vanderbilt University School of Medicine, Nashville, Tenn., 1890; member of the Medical Association of Georgia; aged 63; on the staff of the Patterson Hospital, where he died, Dec. 31, 1930.

Dan Putnam Albee, Roseworth, Idaho; Medical Department of Columbia College, New York, 1888; formerly mayor of Buhl; at one time county health commissioner of Twin Falls County; aged 73; died, Nov. 18, 1930, in West Point.

Daniel Thompson Buzzell ⊕ Wilmington, Mass.; University of Vermont College of Medicine, Burlington, 1883; past president of the Middlesex South District Medical Society; aged 73; died, Dec. 21, 1930, of cerebral hemorrhage.

John H. Andrus, Negaunee, Mich.; University of Michigan Medical School, Ann Arbor, 1885; member of the Michigan State Medical Society; member of the board of education; aged 71; died, Dec. 22, 1930, in the Twin City Hospital.

Cornelius Marcum, Irvine, Ky.; Hospital College of Medicine, Louisville, 1892; member of the Kentucky State Medical Association; past president of the Estill County Medical Society; aged 65; died, January 4, of pneumonia.

Bernard J. Leahy ⊕ Port Jervis, N. Y.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1894; at one time health officer of the town of Deerpark; aged 71; died, Dec. 27, 1930, of acute dilatation of the heart.

John Charles Burks, Roanoke, Va.; Medical College of Virginia, Richmond, 1897; member of the Medical Society of Virginia; surgeon in charge of St. Charles Hospital; aged 57; died, Dec. 5, 1930, of paralysis and thrombosis.

James Lewis Jamison, Wrightsville, Pa.; Jefferson Medical College of Philadelphia, 1882; member of the Medical Society of the State of Pennsylvania; formerly member of the school board; aged 72; died, Dec. 14, 1930.

Arthur V. Lawler, Niagara Falls, N. Y.; University of Buffalo School of Medicine, 1908; on the staffs of the Mount St. Mary's and the Memorial hospitals; aged 45; died, in January, in the Buffalo General Hospital.

George Frederick Rice, Kingston, N. Y.; Medical Department of the University of the City of New York, 1885; member of the Medical Society of the State of New York; aged 74; died, January 7, of cerebral hemorrhage.

Boone William Clarke, St. Louis; Medical Department of Washington University, St. Louis, 1897; aged 56; died, January 10, in St. John's Hospital, of abscess of the lung, following an infection of the foot.

William Francis Walsh, Indianapolis; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1907; aged 48; died, January 5, in St. Vincent's Hospital, of chronic interstitial nephritis.

Ernest Edgar Doble ⊕ Quincy, Mass.; Harvard University Medical School, Boston, 1882; member of the American Otological Society; aged 73; died, January 15, in the City Hospital, of chronic cystitis.

Edward Avery Newton, Los Angeles; University of Pennsylvania School of Medicine, Philadelphia, 1902; member of the American College of Physicians; aged 59; died, Dec. 11, 1930, of heart disease.

Archie McCallister ⊕ Tarpon Springs, Fla.; Medical Department of Emory University, Washington, D. C., 1916; health officer; aged 41; was shot and killed, January 4, by an unknown assailant.

Alfred A. J. Long, York, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1877; member of the Medical Society of the State of Pennsylvania; aged 79; died, Dec. 6, 1930, of carcinoma.

George Warren Blaisdell ⊕ Manchester, Mass.; Long Island College Hospital, Brooklyn, 1881; member of the board of health; aged 74; died, January 5, in Southampton, N. H., of heart disease.

Boris Kwartin, Brooklyn; Long Island College Hospital, Brooklyn, 1924; pathologist to the Beth Moses Hospital; aged 31; died, Dec. 15, 1930, of burns received in an explosion in his laboratory.

John E. Grube ⊕ Punxsutawney, Pa.; Medico-Chirurgical College of Philadelphia, 1891; formerly medical superintendent of the Punxsutawney Hospital; aged 64; died, January 12, of heart disease.

George L. Meyer ⊕ Fort Plain, N. Y.; University of Michigan Medical School, Ann Arbor, 1887; aged 67; died, Nov. 8, 1930, in Stone Arabia, as the result of a cerebral hemorrhage.

John Francis Young, Belmont, Mass.; Harvard University Medical School, Boston, 1879; member of the Massachusetts Medical Society; aged 76; died, Dec. 25, 1930, of diabetes mellitus.

Luther Washington Leonard, St. Albans, W. Va.; University of Louisville (Ky.) School of Medicine, 1908; aged 59; died, Dec. 19, 1930, in a hospital at Charleston, of carcinoma of the lung.

Frederick E. Dehne, Hilbert, Wis.; Marquette University School of Medicine, Milwaukee, 1913; aged 46; died, January 2, in St. Elizabeth's Hospital, Appleton, of peritonitis, following colitis.

Ransom Wells, New York; University of Colorado School of Medicine, Denver, 1926; aged 34; died, Dec. 5, 1930, in the New York Post Graduate Hospital, of bacterial endocarditis.

Eugene E. De Grofft, Woodstown, N. J.; Jefferson Medical College of Philadelphia, 1875; member of the Medical Society of New Jersey; aged 80; died, January 5, of pneumonia.

Walter L. Devany, Dendron, Va.; Medical College of Virginia, Richmond, 1883; member of the Medical Society of Virginia; aged 72; died, January 6, of carcinoma of the bladder.

Frank Newcomer Townley ⊕ Kenesaw, Neb.; Lincoln Medical College, 1910; served during the World War; aged 48; died, Dec. 24, 1930, in a hospital at Hastings, of pneumonia.

Walter Russell McKinley, Columbus, Miss.; Medical College of Alabama, Mobile, 1894; member of the American College of Surgeons; aged 58; died, January 5, of pneumonia.

John W. N. Farrow, Washington, D. C.; College of Physicians and Surgeons, Baltimore, 1879; aged 72; died, January 3, of chronic interstitial nephritis, arteriosclerosis and uremia.

Jennie Van Holland Baker, Brooklyn; New York Medical College and Hospital for Women, 1882; aged 78; died, January 15, of chronic nephritis and chronic myocarditis.

John M. Sturdivant, Cincinnati, Iowa; College of Physicians and Surgeons, Keokuk, 1887; member of the Iowa State Medical Society; aged 64; died recently, of heart disease.

George Biscoe Colby, Darwin, Okla.; Chicago Medical College, 1880; member of the Oklahoma State Medical Association; aged 78; died, Dec. 31, 1930, of peritonitis.

Oesten K. Winberg, Lake Park, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1892; aged 66; died, Dec. 27, 1930, of heart disease.

Roland Aubrey Wiltshire, Stilesville, Ind.; Eclectic Medical Institute, Cincinnati, 1894; served during the World War; aged 59; died, January 12, of heart disease.

Henry Harrison, Boston; Tufts College Medical School, Boston, 1904; member of the Massachusetts Medical Society; aged 59; died, January 3, of angina pectoris.

Worth Edwin Yankey ⊕ Atlanta, Ga.; Atlanta School of Medicine, 1906; on the staff of the Davis-Fisher Sanitarium; aged 45; died, January 10, of pneumonia.

Mary A. Wilson, Mesopotamia, Ohio; Ohio Medical University, Columbus, 1900; aged 70; died, Dec. 29, 1930, as the result of an injury received in a fall.

William Henry Hallowell, Minneapolis; University of Pennsylvania School of Medicine, Philadelphia, 1880; aged 77; died, Dec. 14, 1930, of heart disease.

Elias Payne Case, Oakland, Calif.; State University of Iowa College of Medicine, Iowa City, 1875; aged 80; died, Dec. 23, 1930, of angina pectoris.

John Lincoln Campbell, Warren, Vt.; University of Vermont College of Medicine, Burlington, 1900; aged 69; died, Nov. 9, 1930, of arteriosclerosis.

Edwin Bowen Rossiter, Pottstown, Pa.; Hahnemann Medical College of Philadelphia, 1875; aged 79; died suddenly, Dec. 29, 1930, of heart disease.

Jay Howard Iglehart, Baltimore; University of Maryland School of Medicine, Baltimore, 1903; aged 55; died, January 13, of valvular disease of the heart.

James Campbell Nunn, Bowling Green, Mo.; Hospital College of Medicine, Louisville, 1894; aged 65; died, Dec. 31, 1930, of chronic interstitial nephritis.

Carl August Palm ✠ Colony, Kan.; Medical Department of the University of Illinois, Chicago, 1905; aged 63; died, Nov. 23, 1930, of heart disease.

Arthur J. Huselton, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1902; aged 53; died, Nov. 18, 1930, of myocarditis.

George Lincoln Beswick ✠ Wilmerding, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1889; aged 63; died, January 11, of myocarditis.

Arnold Huff Jennings, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1924; aged 34; died, January 13, of myocarditis.

Clara H. Williams, Wilkinsburg, Pa.; Hering Medical College, Chicago, 1905; aged 66; died, Dec. 21, 1930, of pneumonia following influenza.

Margaret C. Boosing Johnson, Chicago; National Medical University, Chicago, 1896; aged 71; died, Dec. 20, 1930, of perforated duodenal ulcer.

William John Grossman ✠ Butler, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1892; aged 61; died, January 5, of heart disease.

Anna Manning Comfort, New York; New York Medical College and Hospital for Women, 1865; aged 85; died, January 11, of pneumonia.

James M. Moses, Big Sandy, Tenn. (licensed, Tennessee, 1889); also a druggist; aged 76; died, Nov. 13, 1930, of chronic valvular heart disease.

Ellis J. Rowe ✠ Hillsboro, Miss.; College of Physicians and Surgeons, Chicago, 1893; aged 69; died, January 7, of cerebral hemorrhage.

Isaac H. Trimble, Staunton, Va.; Bellevue Hospital Medical College, New York, 1875; aged 81; died, Nov. 21, 1930, of cerebral hemorrhage.

Jesse G. Marshall, Canton, Okla.; North Carolina Medical College, Charlotte, 1899; aged 55; died, Dec. 24, 1930, of cerebral hemorrhage.

John William Rust, Willow Springs, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1897; aged 60; died, January 13.

Watson Lewis Savage ✠ New York; Long Island College Hospital, Brooklyn, 1885; aged 71; died, January 11, of arteriosclerosis.

Lester Aloysius Halloran, Chicago; St. Louis University School of Medicine, 1919; aged 39; died, January 23, of pulmonary abscess.

George Linton Sankey, Snowdoun, Ala.; Louisville (Ky.) Medical College, 1876; aged 78; died, January 3, of cerebral hemorrhage.

Frederick A. Goetz, Chicago; Universitat, Leipzig, Saxony, Germany, 1878; aged 77; died, Oct. 22, 1930, of cerebral hemorrhage.

Patrick H. Walker, Scranton, Pa.; Baltimore Medical College, 1904; aged 52; died, January 19, in the Mercy Hospital, of nephritis.

Asa Clyde Boswell, Kansas City, Mo.; Medical College of Ohio, Cincinnati, 1889; aged 69; died, January 2, of pneumonia.

Henry Luther Montford ✠ Dublin, Ga.; Atlanta Medical College, 1914; aged 42; died, January 5, of septicemia.

I. A. Langston, Waco, Texas; Forth Worth School of Medicine, 1901; aged 66; died, Dec. 13, 1930.

Bureau of Investigation

PARIOGEN TABLETS

Chloramine for "Feminine Hygiene"

There has grown up, during the past four or five years, a huge business in the sale of antiseptics and germicides, real or alleged, that are frankly purchased, if not obviously sold, for contraceptive purposes. Not that the term contraceptive is used in the advertisements; the euphemism, "feminine hygiene," takes its place. Preparations for this purpose are widely advertised in magazines and newspapers. Whether this fact is merely a reflection of the public's changed attitude toward the subject of so-called birth control, or whether the acceptance of such advertisements merely means that the lean years in the advertising field have brought about a change of standards in what is acceptable, is a question on which there may be some difference of opinion.

"Pariogen Tablets," marketed by American Drug and Chemical Company of Minneapolis, have been advertised as the "new mode of personal hygiene." A typical advertisement that appeared in a large number of popular magazines developed the thesis that the modern American woman knew "how to take care of herself"; that she is able to preserve the bloom and buoyancy of youth far beyond her allotted years because of her knowledge of "personal hygiene." The same advertisement explained how heretofore—that is, before the creation of Pariogen Tablets—"personal hygiene" had been achieved at great discomfort, that it was seldom convenient and, under some conditions, impossible. Thanks, however, to the development of Pariogen Tablets, it was now unnecessary to have any accessories or water. To quote from the advertisement:

> "Pariogen Tablets may be carried anywhere in a purse, making hygienic measures possible almost anywhere, no other accessories or water being required."

The advertising has stressed, also, that Pariogen Tablets are nonpoisonous, that they contain no carbolic acid, no bichloride of mercury, no cresol, and yet they are said to "destroy most objectionable germs in a few seconds." To quote from some of the Pariogen literature:

> "Pariogen Tablets offer to womankind a protection, comfort and convenience heretofore unknown. The modern woman has, for the first time in the history of feminine hygiene, an EFFECTIVE, SAFE and CONVENIENT germ destroying medication."
>
> "The CONVENIENCE, COMFORT AND FULL PROTECTION thus afforded against invading germs is a boon for womankind which cannot be measured in dollars and cents."
>
> "As a prophylactic, simply insert one tablet well up in the vagina when necessary."
>
> "Years ago, we did not understand the importance of 'Precautionary Personal Hygiene.' TODAY WE DO."
>
> "The Modern Mother will frankly discuss these matters of personal hygiene with her daughter. Thus the young girl, on reaching maturity, will not stumble along unguided or be influenced by unwise and harmful suggestions from others."

Like all "patent medicines," the advertisers of Pariogen Tablets are as vague and noncommunicative regarding the composition of their product as they are insistent and definite on its alleged virtues. American Drug and Chemical Company, exploiters of Pariogen, tells the purchaser or prospective purchaser that Pariogen Tablets contain no carbolic acid, no bichloride of mercury, no cresol, no caustics, no silver nitrate; but on what they *do* contain, they are silent. It is true that some six or more years ago, information was furnished the medical profession in a left-handed way. The *Journal-Lancet*, whose advertising pages at that time were nothing to be proud of, carried advertisements of Pariogen Tablets, and in the "Reading Notice" department, there was published what purported to be an article by Clara M. Luther, M.D., of Minneapolis, under the title, "Sodium Paratoluene-Sulfonchloramide: Its Importance as a Vaginal Antiseptic and Use." It is possible that one per cent of the readers of the *Journal-Lancet* recognized in the somewhat horrific terminology, paratoluene-sulfonchloramide, the chemical name of the well-known pharmacopeal product, chloramine.

The "Reading Notice" by Clara M. Luther went on to state that there had been recommended to her a sodium paratoluenesulfonchloramide compound, which is put up in tablet form, and that these tablets were known as Pariogen. Dr. Luther further declared that in view of the fact that Pariogen Tablets would dissolve in the vaginal secretions and "retain very effective disinfectant properties for a period of about one hour after the introduction of each tablet," Pariogen Tablets were of value "as a prophylactic agent and hygienic measure." She also stated that these tablets were "nonirritating to healthy mucous membrane"; obviously, there can be no object in using such tablets where the vaginal mucous membrane were healthy except for purposes of contraception.

[Copyright: 1921: By The Chicago Tribune.] posers as does Miss Verson.

Feminine Hygiene

Now possible without danger or inconvenience. Use Pariogen Tablets, the new feminine antiseptic. No water, no accessories required. Non-poisonous, non-caustic; will not harm the most delicate tissues. A powerful antiseptic and germicide. Pariogen Tablets are packed twelve in a tube about the size of a fountain pen. Convenient anywhere. Learn of this new convenience and safety in feminine hygiene today. One dollar the tube at all drug stores and drug counters.

PARIOGEN TABLETS

Summed up, then, Pariogen Tablets are essentially tablets of chloramine, U. S. P. By selling these under a proprietary name as a nostrum of essentially secret composition, the company is able to get a price that is out of all proportion to the value of its product. And this difference between purchase price and value is used to pay newspapers and magazines for advertising that makes the contact between purchaser and seller through high-pressure advertising methods!

Correspondence

A SIMPLE TEST TO DIFFERENTIATE BETWEEN OBSTRUCTIVE AND OTHER TYPES OF JAUNDICE

To the Editor:—Dr. M. A. Blankenhorn states in THE JOURNAL, Oct. 11, 1930, that the differentiation between painless jaundice due to obstruction and catarrhal or arsphenamine jaundice is often impossible without an operation. I believe that this represents the current view, but those who have had an experience with the galactose tolerance test know better. Richard Bauer published a paper on this simple and reliable test as early as 1906, and the practical value of the test has since been confirmed by Warren R. Sisson, Woerner, and many others (Bauer, Richard: *Wein. med. Wchnschr.* **66**:2537, 1906; *Wien. Arch. f. inn. Med.* **6**:9, 1923. Sisson, W. R.: A Clinical Study of Two Hepatic Functional Tests, *Arch. Int. Med.* **14**:804 [Dec.] 1914. Woerner: *Med. Klin.*, 1919, number 45. Davies, D. T.: *Lancet* **1**:380 [Feb. 19] 1927). The galactose test can be carried out by any practitioner and it deserves certainly to be more generally known. There are no contraindications and no undesirable after-effects.

The patient receives in the morning on an empty stomach 40 Gm. of galactose (puriss. Merck or Kahlbaum) in about 400 cc. of tea. It is best to give no more carbohydrates for the next four hours, when the ordinary diet may be resumed. The urine during the first four hours after the galactose breakfast is collected (specimen 1) and again during the next four hours (specimen 2). Tests for sugar are made by Fehling's, Benedict's or Nylander's method. If no sugar is found, the galactose test is obviously negative; if sugar is present, it is necessary to measure the amount of urine and to determine quantitatively how much galactose has been excreted. This is easily done by polarization exactly as the examination of a diabetic urine, but the result obtained in percentage of dextrose has to be multiplied by 0.65 to show the percentage of galactose (the dextrorotatory power of galactose is much greater than that of dextrose). Blood sugar tests are unnecessary.

The galactose test is considered negative if less than 2 Gm. has been excreted; it is doubtful or slightly positive if from 2 to 3 Gm. is found, and it is distinctly positive, if the amount of galactose excreted in the urine exceeds 3 Gm.

The galactose test is always negative in uncomplicated jaundice due to obstruction of the bile ducts (usually through gallstone or carcinoma); the test is invariably positive in catarrhal and arsphenamine jaundice even during reconvalescence, and this fact proves that these types of jaundice are not due to obstruction but to a "hepatitis." The result varies in cirrhosis of the liver and in obstructive jaundice complicated by infection (fever) according to the degree of "hepatitis."

I have learned to appreciate the practical value of the galactose test in an experience of many years at Professor Wenckebach's clinic in Vienna and the German Hospital in London. Much time and money is wasted nowadays in unnecessary laboratory work, but this simple test practically always gives valuable information and it should be carried out in every doubtful case of jaundice, at least before resorting to the knife. Icteric patients are particularly bad subjects for operations.

F. E. LOEWY, M.D.,
13 Welbeck Street, W. 1,
London, England.

[NOTE.—The letter by Dr. Loewy was referred to Dr. Blankenhorn, who replies:]

To the Editor:—Dr. Loewy's criticism of my recent paper on jaundice is valid criticism—if the galactose tolerance test of liver function is as good as Dr. Loewy thinks it is. My estimate of the galactose test for liver function, as shown by not mentioning it, is shared by most writers of textbooks in this country dealing with the clinical aspects of jaundice. I may mention that Osler's Modern Medicine, 1926, describes seven tests but not galactose; the Oxford System (Rolleston's Treatment of the Subject) does not mention it; Blumer's Bedside Diagnosis describes eight tests but not galactose; Oxford Monographs on Diagnosis and Treatment lists twenty-five tests, among them galactose, but makes no comment on its use or estimate of its value. In current literature of this country, the galactose test has been discussed but generally discarded. Snell, Greene and Rowntree (*Arch. Int. Med.* **36**:273 [Aug.] 1925), after a survey of liver function tests and a study of 800 cases, say that "glucose and galactose have proved unsatisfactory for clinical use. Fructose has been more satisfactory but the clinical importance of the fructose tolerance test is still undecided."

Perhaps the majority in this country are misinformed or have abandoned the galactose test unwisely. Dr. Loewy has found the test valuable in his many years of experience and although he does not cite his own publications of results does cite work to corroborate his opinion. He cites Richard Bauer, who described the test in 1906 and who reported again on the test in 1923. But Bauer does not claim as much as Dr. Loewy. Bauer says in 1923 that by "further improving the test and combining tests much information is to be expected."

Dr. Loewy also cites Woerner, who collected German literature on the test and found that in 165 instances with catarrhal jaundice 80.5 per cent gave positive tests. He states that the single practical value lies in differentiating catarrhal jaundice from obstructive jaundice, but he does not claim that the test is "practically always" reliable, as does Dr. Loewy.

Dr. Loewy cites Davies; but Davies studied his patients in four particulars: (1) as to duration; (2) clinical diagnosis; (3) blood urea, nonprotein nitrogen, uric acid, cholesterol, van den Bergh, Fouchet, and galactose tolerance test; (4) urine—bile salts, bile pigment, urobilin, diastase and sugar. He concludes that, "armed with the results of these tests, one can arrive at a diagnosis which is within the range of great probability."

Dr. Loewy also cites Dr. Warren Sisson of Boston. In 1914 Sisson concluded that the "galactose test may be of great value in differentiating icteric from other hepatic conditions showing biliary stasis." Dr. Sisson's report was not adequate proof, mainly because an insufficient number of cases were studied. Dr. Sisson claims no more than that the test "may be of great value," but since 1914 Dr. Sisson has done no more with the test so far as I am able to learn.

I think Dr. Loewy's criticism of my paper is not valid until the galactose test is better established. The doctor should continue his studies and publish his results.

M. A. BLANKENHORN, M.D., Cleveland.

SCRATCH VS. MULTIPLE PUNCTURE METHOD IN VACCINATION

To the Editor:—I have noted the following statement in the review of the Handbook of Pediatric Procedure by Smyth:

> The methods given for smallpox vaccination are the multiple puncture and the intradermal methods. No mention is made of the scratch method, which is undoubtedly by usage and general acceptance the standard method for vaccination.

Permit me to call attention to the reports by Dr. J. P. Leake in *Public Health Reports* (**42**:221 [Jan. 28] 1927) and by Dr. Charles Armstrong in THE JOURNAL, March 10, 1928, p. 738. Both of these men are eminent authorities on the subject of smallpox vaccination and both write with the approval of the United States Public Health Service. Both recommend the multiple puncture method as the method of choice for smallpox vaccination. Dr. Armstrong brought forward evidence indicating that the scratch method was by no means a method of choice. The multiple puncture method has been so definitely recommended as a proper procedure in vaccination that many commercial firms include a description of this method with their packages of smallpox vaccine.

T. B. MAGATH, M.D., Rochester, Minn.

THE JENNINGS SELF-RECORDING TEST FOR COLOR-BLINDNESS

To the Editor:—In 1917 the United States government bought a large number of sets of the Jennings test for color-blindness for the army, navy and aviation services. From this extensive use of the test it was found that certain colors indicating color-blindness were often punched by persons with a normal color sense. These objectional colors were removed, others substituted, and a second edition of the test was introduced. Recently it has come to my notice that about six months ago the government sold at auction a quantity of the old, obsolete sets to a certain surgical supply house, which is now selling them to physicians and institutions. Physicians desiring the up-to-date second edition of the Jennings Test should see that it is made by the C. H. Stoelting Company, 424 North Homan Avenue, Chicago.

J. E. JENNINGS, M.D., St. Louis.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

BLOOD CHANGES IN CHILD

To the Editor:—A patient of mine, aged 11 years, has a lymphatic leukemia, the blood being as follows: hemoglobin, 71 per cent; red blood cells, 3,900,000; white blood cells, 9,600. The differential count of leukocytes is: polymorphonuclear neutrophils, 41 per cent; lymphocytes, 49 per cent; mononuclears, 5 per cent; eosinophils, 4 per cent, and basophils, 1 per cent. A younger sister of his, aged 5 years, died last year of leukemia. At present he has hypertrophied tonsils and enlarged cervical glands but otherwise appears to be a normal healthy boy. I would appreciate your advise, first, regarding the best and most efficient methods to improve the general health of this boy and if possible to check the leukemia. Secondly, is it safe and advisable to remove his tonsils at present; if so, should they be removed surgically or by the desiccation method? Thirdly, what prognosis can I give to his parents relative to this condition?

SIDNEY SCHEINMAN, M.D., New York.

ANSWER.—The observations on the blood as stated in the inquiry do not indicate lymphatic leukemia. Indeed, the blood examination shows a moderate degree of anemia with some reduction in the neutrophils, a slight increase in the lymphocytes as well as the presence of mononuclear cells and eosinophils in small numbers. The patient's general health might be improved by advising fresh air, sunlight, moderate exercise outdoors and a diet rich in vitamins and iron-containing foods.

It is difficult to advise about the removal of the tonsils. One would have to ask whether the tonsils are frequently the source of inflammation, whether they cause symptoms of obstruction, and whether there is considerable enlargement of the lymph nodes. Perhaps, on the whole, it would be wise to defer immediate operation and attempt to improve the quality of the patient's blood by treating the anemia. At a later time it may be advisable to remove the tonsils. The technic of their removal is largely a personal matter with surgeons, though there appears to be no contraindication for their complete enucleation in this case, unless other complications arise which have not been referred to in this inquiry.

In consideration of the facts presented, there seems to be little cause for anxiety and a favorable prognosis may be made.

USE OF METHANOL AS AN ANTIFREEZE MIXTURE

To the Editor:—A short time ago I had some of the new antifreeze mixture put in the radiator of my car; a little later I read an article in *Hygeia*, November, 1930, page 1032, concerning a warning against the use of the new mixture. I took the clipping to the party who sold the mixture to me and he declared that it was propaganda and gave me a yellow sheet, as his authority for selling it, which contained the following: (Circular prepared by DuPont): "Authorities on public health hazards have been consulted regarding all possible risks. These authorities agree that the danger of absorption of methanol by contact with the skin or by inhalation of vapors is no more serious than the dangers incident to the use of gasoline or other materials commonly used about any automobile. . . . It is also true that, in those sections of the country where wood alcohol is manufactured, it has been regularly used in radiators with entire safety. . . . During the winter 1929-1930, carefully controlled tests on cars of various makes have conclusively proved that 'Anti-Freeze Methanol' under actual operating conditions evaporates less than denatured alcohol from the radiator." I should be pleased to have you make any comment you desire, as I am still wondering whether or not I should drain the radiator and use straight alcohol as I have done other years. The party selling it stated that he did not care to sell any mixture dangerous to health and claimed by the yellow sheet that methanol was and is not dangerous and you say it is. Who is right?

M. H. MATTS, Pueblo, Colo.

ANSWER.—An opinion rendered, Nov. 25, 1930, by the attorney general of the state of Ohio, has some bearing on this situation. In part, this opinion reads: "Synthetic methyl alcohol may be sold in Ohio only by registered pharmacists. . . ." Commenting on this ruling, the attorney general states: "I am advised that this substance in its toxic qualities is identical with wood alcohol, that it is a virulent poison and has the same effect on the human system as methyl alcohol, commonly known as 'wood alcohol.' I am further advised that it differs from wood alcohol in that it is colorless and odorless. It is obvious that because of these last two characteristics, it is, of course, far more dangerous than wood alcohol."

It is not to be inferred from the article in *Hygeia* or any other publication that every user of methanol (methyl alcohol) in radiators will be harmed by that substance. Under normal operating conditions no great harm may be anticipated for the

occupants of automobiles. When, however, fortuitous events arise leading to the boiling off of methanol (methyl alcohol), or leaks leading to skin contact with this substance, considerable numbers of persons so exposed may be expected to be definitely harmed. Animal experimental work, carried out under conditions that preclude any inhalation of the methyl alcohol, demonstrates beyond controversy the toxicity of methyl alcohol by skin absorption. Small animals may be killed within twenty-four hours by this procedure.

The main hazard in the course of normal activities involves not occupants of cars but garage workers, particularly radiator workers, who are prone to contact with the contents of the radiator either in the form of vapors or through the skin. One part of methyl alcohol in 10,000 parts of air is regarded by the International Labor Office as the threshold of toxicity.

Widespread use of this substance, either synthetic or natural, will each year result in a number of distressing accidents and the probability of instances of permanent blindness and some deaths. This hazard is probably no greater than that of carbon monoxide connected with automobile exhaust fumes, but carbon monoxide yearly exacts an unwarranted toll in garages, both private and public.

At the immediate time the situation is complicated with further possible but undetermined hazards growing out of the fact that crude synthetic methyl alcohol (methanol) is being sold for antifreeze purposes. The content over and above that of methyl alcohol (methanol) is partly water and partly a group of little known organic substances accidentally produced in the processes of synthetizing the substances that lead to methyl alcohol (methanol). Until the toxicity of these extraneous substances is established, additional significance must be attached to the entire situation.

DIASTOLIC PRESSURE

To the Editor:—I have noticed in two instances recently in taking blood pressure readings that the diastolic pressure registered zero. Can you tell me of what significance this is, if any? In neither case did the patient seem to be extremely ill. They were both adult patients under treatment for irregular heart action.

ROY TRUCKENMILLER, M.D., Freeland, Pa.

ANSWER.—Strictly speaking, the diastolic pressure is never zero, for to be such would predicate an empty vessel, a condition incompatible with life. Such an apparent reading, however, connotes a diminished elasticity of the walls of the arterioles and capillaries, producing a lowered peripheral resistance and a more complete emptying of the larger arteries. As a result, the pulse itself becomes brusque enough to elicit sound vibrations from the artery, the sounds persisting even when the artery is relieved of all compression. It may be encountered in neurocirculatory asthenia, aortic insufficiency, hyperthyroidism, following exercise and, not uncommonly, while in an exceedingly warm room. It is often associated with a capillary pulse.

In determining the diastolic pressure in the presence of this phenomenon, it is important to apply the bell of the stethoscope with only the least amount of pressure on the artery and to reckon the manometer reading attained at the beginning of the fourth Korotkoff sound as its measure. Fallacious diastolic determinations may thus be obviated.

TREATMENT OF SYPHILIS

To the Editor:—I am the victim of a chancre which appeared on my left index finger in April, 1929, and which was diagnosed in retrospect when "secondaries" appeared two months later. I took twenty-six doses of neoarsphenamine rather sporadically during the following year, together with a moderate amount of mercury by mouth and a few doses of bismuth. I was negative from November, 1929, to June, 1930, and supposed I was cured but find myself 4+, Nov. 1, 1930. I have started intensive neoarsphenamine and bismuth treatment; that is, 0.9 Gm. of neoarsphenamine once a week and thiobismol twice a week. I expect to take ten doses of neoarsphenamine and twenty of bismuth, then about twenty of mercury intramuscularly and then repeat. Is this best or can you suggest a better method? I had treated syphilis so much that I suppose I became careless, but I am certainly anxious to obtain a cure. Please omit name.

M.D., Wisconsin

ANSWER.—A negative Wassermann reaction after a brief course of treatment should not be regarded as an indication of a clinical cure of syphilis. It is a frequent experience that, after a lapse of antisyphilitic treatment, a return of a positive Wassermann reaction occurs. Then intensive treatment is again indicated. The continuous method of treatment outlined should be undertaken, although some rest periods are indicated between courses. The dose of neoarsphenamine is rather large and if it is employed the slightest danger signals should be carefully watched for. Early by-effects that are sometimes observed include flushing, coughing, garlic taste, nausea or vomiting. The most that can be expected is a clinical cure. A thorough examination at intervals with particular attention to the central nervous system and the vascular organs should not be neglected.

TREATMENT OF NECROSIS AFTER INJECTION OF VARICOSE VEINS

To the Editor:—Please inform me of the methods of treatment of necrosis following the injection treatment of varicose veins, and references to any articles on this subject. Please omit name.

M.D., Illinois.

ANSWER.—The management of necrosis following injection treatment is readily grouped into measures instituted immediately after injection and later procedures. When there is an intense burning, localized to the site of injection, with blanching and ballooning of the skin, a perivenous injection has been made. The injection of about 5 cc. of 1 per cent procaine hydrochloride solution not only stops the pain but dilutes the concentrated solution and may prevent a gangrene of the overlying skin. Even better than procaine hydrochloride seems the injection of 5 cc. of the patient's own blood, taken from a neighboring varix. The blood not only serves to dilute the injected drug but causes a marked hyperemia, which helps to absorb the damaged tissue.

If the injection beside the vein is recognized only a few days later, the area of infiltration around the injected vein is painful on pressure but the skin is normal. A spontaneous absorption will take place. If, however, the skin is red and glossy, it will break down at the slightest injury and should be protected by a light dressing. Dry heat and a 30 per cent mercury ointment seem to hasten absorption of the necrotic mass from under the unbroken skin. If there is a true gangrenous patch at the site of injection, it should be excised under aseptic conditions and the wound sutured. Unless this is done early, when the necrosis is yet aseptic, a secondary infection will set in. At this stage, some advocate antiseptic dressings, which will slowly clear up the gangrenous ulcer. If the infected area is well localized, it may also be excised but left unsutured and permitted to heal by secondary intention. All these procedures require good surgical judgment and adequate facilities. They should not be done in the office. An article by Kilbourne (The Varicose Veins Slough, THE JOURNAL, Sept. 13, 1930, p. 787) recommends an antiseptic lotion for the treatment of sloughs.

DERMATITIS FROM HANDLING DYED SHEEPSKINS

To the Editor:—Several workers in a garment factory handling dyed sheepskins have broken out with a papular rash, involving the anterior and posterior surfaces of the arms and the face around the mouth. The rash manifests itself, first, as a small macule with intense itching, which, in a few days, becomes a small papule with a hard base. The lips become dry. There are no gastro-intestinal or urinary manifestations. There is no lead line on the gums. My observation is that the handlers of the fur did not all get this rash. It prevailed among the seamstresses. Watching them at work, I have observed that they wipe the moisture off their lips with their dye-stained hands; also, in threading the needle they bite off the end of the thread. My conclusions are that the mixing of this dye with the saliva results in some form of aniline poisoning that manifests itself as the rash and itching. The sheepskins, undyed, handled by the same workers do not produce rash. Sheepskins, dyed differently than with this particular brown dye, also fail to produce a rash. I am sending under separate cover a sample of the material so that you can see for yourself what the material consists of. My advice to the workers in handling this situation so that it would clear up was merely external cleanliness—to wash their hands in soap and hot water once every two hours to prevent absorption of the dye. I would appreciate any information by which this situation can be solved.

J. H. BENDES, M.D., Rockford, Ill.

ANSWER.—Without actual chemical analyses on the sample submitted, it appears highly probable that the condition described is occupational and attributable to diamines, of which paraphenylendiamine is most used. Toluylendiamine is less toxic than the phenyl salt. In the trade, ursol or ursol black is descriptive of paraphenylendiamine. These dyes are in extensive use in obtaining brown and black colors in furs. Both the maker and the wearer of these furs are subject to its harmful action. Department stores and other dealers in furs receive fairly frequent complaint because of the harmful action of these dyes or from derivatives in the finished product.

While a dermatitis is the commonest lesion, asthma has been produced; likewise a condition akin to angioneurotic edema, and possibly hepatitis may be produced. The skin lesions are prone to appear at the point of contact with the fur, or the irritant

may be transferred by the hands to the eyelids, face or neck. If exposure is continued, a chemical sensitization appears to be created, which leads to extensive involvement on slight exposure. Control of this condition is not easy. Thorough washing of the skins or furs at the time of dyeing is said to be an efficient preventive measure. The application of oily materials to the hands is usually unpractical in the handling of furs and skins. Persons who become highly sensitive to the action of these dyes may profit by a change of work.

PERICOLIC MEMBRANE

To the Editor:—A man, aged 22, has what I think is a congenital deformity in the colon, especially the ascending colon, in that it was enclosed in a sac, a thin walled membrane drawing the colon up from 2 to 3 inches above its normal position, the sac adhering to the upper fourth of the ascending colon. The appendix was retrocolic and adhered for its entire length to the posterior portion of the colon. The patient has had bowel trouble since he was 3 weeks of age, suffering from constipation and then diarrhea. He would turn a green or jaundice color. The attack would last a few days and then apparently clear up. About six years ago he had an acute attack of appendicitis which was, from the history, severe. Since that time he has had repeated attacks of acute appendicitis. There were no stones in the gallbladder and none that we could find in the ducts. He has been improving steadily since the operation and the removal of this sac four weeks ago. Since the operation he has not had to take any laxatives.

DRS. F. A. and A. W. GRAHAM, Lincoln, Neb.

ANSWER.—The condition described appears to be an example of pericolic membrane. This structure is most frequently referred to as Jackson's membrane. The bands producing this picture are variously ascribed to fetal peritonitis and to developmental malformations of the peritoneum. The whole subject of peritoneal bands is discussed in an article by S. C. Harvey on "The Peritoneal Relations of the Ascending Colon, Caecum, Appendix and Terminal Ileum" in the *Annals of Surgery* **67**:641 (June) 1918. Jackson's membrane is discussed and well illustrated in an article by H. Vollmar in the *Archiv für klinische Chirurgie* **153**:9, 1928.

VIBRATION OF AIR HAMMER

To the Editor:—One of our employees who operated a light air hammer in the sheet metal department came in in July complaining of pain in the region of the last cervical and first dorsal vertebrae, which he ascribed to his occupation. All subjective signs, including roentgenographic, were and are negative. He continued to work for a few days and was laid off up to the present time. The treatment has been principally light therapy and rest. He still claims disability and pain at the original location, on using his arms. This is the only case of the kind I have seen and I fail to find reference to such in my library. Please give me what information you can and your opinion as to whether it is occupational. He may be malingering or magnifying his disability on account of being laid off.

G. C. CHAMNESS, M.D., Racine, Wiss.

ANSWER.—Vibration from air hammer work may lead to cysts (ganglions) of the tendons of the hands and wrists, low-grade diffuse cellulitis of the hands and forearms, and bursitis about the elbow or shoulder girdle.

Primary involvement of the vertebrae, properly attributable to this cause, is not well established. A chronic arthritis of the spine from other causes may be aggravated and made painful by air hammer work. It is to be recalled, however, that a spinal arthritis is rarely localized in the region of the lower cervical and first dorsal vertebrae. The vibration from air hammer work is conducive to neuroses of divers forms. In the absence of a demonstrable spinal arthritis, it is in the domain of the occupational neurosis that explanation of the condition mentioned is likely to exist.

EFFECTS OF HYPNOTICS ON NARCOTIC ADDICTS

To the Editor:—Do not chloral and bromides, when given to a morphine addict, even in much smaller doses than those given to a person not addicted, accumulate much more rapidly in such a subject and even tend more to cause a drug psychosis than when given in much larger doses to one whose secretions and excretions are normal? Please omit name.

M.D., Louisiana.

ANSWER.—It is true that in some cases of morphinism bromide, chloral hydrate and other sedatives used during the withdrawal period seem to intensify the condition. A drug that may produce stupor and lessen the reflex irritability in one case may be a positive injury in another. It seems impossible, in the present state of our knowledge, to give the precise reason for this. Blaming deficient elimination for it is probably not justified, as morphine per se does not produce disease of the organs of elimination, least of all of the kidneys.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALASKA: Juneau, March 3, 1931. Sec., Dr. Harry C. De Vighne, Juneau, Alaska.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination in nineteen cities in the United States and Canada. March 14, 1931. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh, Pa.

CALIFORNIA: Reciprocity, San Francisco and Los Angeles, March 18, 1931. Sec., Dr. C. B. Pinkham, 420 State Office Bldg., Sacramento, Calif.

CONNECTICUT: New Haven, Feb. 14, 1931. Basic Science, State Board of Healing Arts, 1895 Yale Station, New Haven, Conn. Homeopathic, New Haven, March 10, 1931. Sec., Dr. E. C. M. Hall, 82 Grand Ave., New Haven, Conn.

NATIONAL BOARD: Parts I and II held in any class A medical school on Feb. 11-13, 1931. Dir., Mr. Everett S. Elwood, 225 South 15th St., Philadelphia, Pa.

NEW HAMPSHIRE: Concord, March 12-13, 1931. Sec., Dr. Charles Duncan, Concord, N. H.

OKLAHOMA: Oklahoma City, March 10-11, 1931. Sec., Dr. J. M. Byrum, Shawnee, Okla.

PORTO RICO: San Juan, March 3, 1931. Sec., Dr. Diego Biascoechea, Box 804, San Juan, P. R.

VERMONT: Burlington, Feb. 10-12, 1931. Sec., Dr. W. Scott Nay, Underhill, Vt.

WISCONSIN: Madison, March 21, 1931. Basic Science. Sec., Prof. R. N. Bauer, 3414 W. Wisconsin Ave., Milwaukee, Wis.

Alaska March, June and September Examinations

Dr. Harry C. DeVighne, secretary of the Territorial Medical Examining Board of Alaska, reports the written examination held at Juneau, March 4, June 10 and Sept. 2, 1930. The examinations covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Three candidates were examined and passed. The following colleges were represented:

College	PASSED	Year Grad.
Northwestern University Medical School		(1904)
University of Minnesota Medical School		(1929)
University of Louisville School of Medicine		(1926)

Tennessee June Examination

Dr. Alfred B. DeLoach, secretary of the Board of Medical Examiners of Tennessee, reports the written examination held at Memphis, Nashville and Knoxville, June 13-14, 1930. The examination covered 8 subjects and included 64 questions. An average of 75 per cent was required to pass. One hundred and fifty-five candidates were examined and passed. One candidate was granted a temporary permit. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
College of Medical Evangelists	(1929) 78.7,	(1930)	82.7
Tulane University of Louisiana School of Medicine		(1930)	83.7
Jefferson Medical College		(1930)	83.6
University of Pennsylvania School of Medicine		(1927)	85.2
Meharry Medical College	(1908) 77.7, (1930) 78.2, 79.3, 79.6, 80.5, 80.7, 80.9, 81.3, 82, 82.5, 83, 83, 83.9, 84, 84, 84.1, 84.1, 84.1, 84.2, 84.5, 84.6, 84.7, 85.1, 85.2, 85.3, 85.7, 85.7, 85.7, 85.9, 86.6, 86.6, 86.7, 87.9, 88.1		
University of Tennessee College of Med.	(1930) 75, 75.2, 76.5, 77.3, 77.5, 77.7, 77.7, 78.2, 78.3, 79, 79.3, 79.7, 79.7, 79.9, 80, 80.3, 80.5, 80.6, 80.6, 80.6, 81, 81, 81.2, 81.3, 81.3, 81.5, 81.6, 81.7, 81.7, 81.9, 82, 82, 82.1, 82.1, 82.2, 82.2, 82.5, 82.6, 82.6, 82.7, 82.7, 82.7, 82.7, 82.9, 82.9, 82.9, 82.9, 83, 83, 83.1, 83.1, 83.2, 83.2, 83.5, 83.6, 83.6, 83.6, 83.9, 84, 84.1, 84.1, 84.1, 84.5, 84.6, 84.7, 84.7, 84.9, 84.9, 85.2, 85.2, 85.3, 85.7, 86.1, 87.6		
Vanderbilt University School of Medicine	(1927)		83,
	(1928) 83.9, 84.9, 83.7, (1930) 78.7, 81.2, 81.2, 81.7, 81.9, 82.1, 82.2, 82.2, 82.6, 82.6, 82.7, 82.7, 82.9, 83.2, 83.6, 83.7, 83.7, 83.7, 83.9, 83.9, 84, 84.1, 84.5, 84.5, 84.7, 84.7, 84.9, 84.9, 84.9, 85, 85.1, 87.2, 87.6, 88.7		
University of Virginia Department of Medicine		(1930)	86.6
Marquette University School of Medicine		(1930)	83.5
Dalhousie University Faculty of Medicine		(1924)	84.6

College	TEMPORARY PERMIT	Year Grad.
University of Tennessee College of Medicine		(1912)

Dr. DeLoach also reports 14 physicians licensed through reciprocity with other states and 2 by the endorsement of credentials from Jan. 1 to Dec. 31, 1930. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University Medical School		(1920)	Dist. Colum.
Atlanta Medical College		(1894)	Georgia
University of Georgia Medical Department		(1927)	Georgia
Emory University School of Med.	(1914) Georgia, (1928)		Alabama,

American Medical Missionery College, Chicago	(1910)	Michigan
University of Louisville School of Medicine	(1910)	Kentucky
Tulane University of Louisiana School of Medicine	(1928)	Mississippi
Johns Hopkins University School of Medicine	(1927)	Maryland
St. Louis University School of Medicine	(1928)	Missouri
Washington University School of Medicine	(1925)	Missouri
Meharry Medical College	(1927)	Virginia
University of Virginia Department of Medicine	(1925)	Virginia
McGill University Faculty of Medicine	(1925)	Michigan

ENDORSEMENT OF CREDENTIALS

College	Year Grad.	Endorsement of
Washington University School of Medicine	(1929)	N. B. M. Ex.
University of Pennsylvania School of Medicine	(1929)	N. B. M. Ex.

Arkansas Eclectic May Examination

Dr. Claude E. Laws, secretary of the Eclectic Board of Medical Examiners of Arkansas, reports the oral and written examination held at Little Rock, May 12 and 13, 1930. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. The following college was represented:

PASSED

College	Year Grad.	Per Cent
Kansas City College of Medicine and Surgery	(1925)	86.4

Book Notices

LABORATORY PEDIATRICS. By John D. Lyttle, A.B., M.D., Assistant Clinical Professor of Diseases of Children, College of Physicians and Surgeons, Columbia University, N. Y. Supervising editor Royal Storrs Haynes, Ph.B., M.D., Clinical Professor of Diseases of Children, College of Physicians and Surgeons, Columbia University. Volume XX, Clinical Pediatrics. Cloth. Price, $85 per set of 21 volumes (sold only in set). Pp. 189, with 31 illustrations. New York: D. Appleton & Company, 1930.

This volume forms a unit of a series of monographs called "Clinical Pediatrics." The book was expressly intended for the general practitioner to aid him in understanding such tests as are used in pediatric cases that come under his care. Nothing but procedures of fundamental nature are discussed. The author has indicated in his preface that chemical and bacteriologic methods that call for special equipment, technical skill and experience are best left to those who possess such equipment and skill. This is in keeping with the policy adopted in preparing the other monographs of this series. The material is essentially clinical in its methods of presentation and only data of practical interest to the general practitioner are presented. The first chapter deals with the urine. The organization of this part of the book corresponds in general to that which is subsequently adopted in presenting the subjects of blood, serology, cerebrospinal fluid, and feces. The first thing considered is the indication for urinalysis, where it may be of aid in diagnosis, methods of collection and preservation, and a description of the composition of the urine of the new-born and of children. Tests used in routine chemical analysis are briefly discussed and the clinical interpretation of the results of such tests are indicated. Microscopic observations are likewise considered. A brief consideration of kidney function tests is included in this chapter. The other chapters are in keeping with this concise and practical manner of presentation.

THE ORIGIN OF THE HUMAN SKELETON: AN INTRODUCTION TO HUMAN OSTEOLOGY. By R. Broom, D.Sc., F.R.S. Cloth. Price, 10/6. Pp. 164, with 47 illustrations. London: H. F. & G. Witherby, 1930.

This book follows the origin of the human skeleton back through the reptiles and amphibia to the earliest vertebrates. The author has given many years to the study of South African reptiles, including fossil forms, and on the basis of that study has marked out what he thinks is the line of human evolution. In this volume he presents only a part of the results of his work. The evolution of the soft parts will be treated in other volumes to be published later. Dr. Broom says that the vertebrates arose as animals buried in the mud of the sea floor. Because they had no need of it, they lost the exoskeleton of the invertebrates, and substituted for it an internal skeleton made by modification of the connective tissue. He believes that the visceral skull bones arose from the fusion of bony skin plates which underlay the ubiquitous teeth, and that the bones of the brain case arose as plates in the dermis of the head larger than those over the trunk because of the smaller amount of motion in the head. He regards the walking limbs of the amphibia as derivatives of the anterior part only of the swimming fins of fishes, the posterior part of the fin having been lost when the animal definitely abandoned the water. At the end of the book is a brief review of theories of the causes of progressive evolution as proposed by Lamarck, Darwin and Smuts. The book will appeal to all students interested in this subject.

LABORATORY MEDICINE: A GUIDE FOR STUDENTS AND PRACTITIONERS. By Daniel Nicholson, M.D., Assistant Professor of Pathology, University of Manitoba. Cloth. Price, $6. Pp. 433, with 109 illustrations. Philadelphia: Lea & Febiger, 1930.

The purpose of this book, as expressed by the author, is to provide in detail information on the indications, methods and interpretations of useful tests that a medical practitioner should be able to perform. The increasing stress that is being placed on laboratory tests as an aid in medical diagnosis makes this book a distinct contribution to the practitioner. The author has not only collected material on laboratory methods, which he has brought down to date, but has indicated where they may be of most value as aids in diagnosis. The organization of the book is excellent and the material is in such form that every physician will find the information he desires set forth in a comprehensive manner. The author has wisely selected only those tests which are most useful in diagnosis and which at the same time may be performed with limited facilities. A special feature of the book is the development of laboratory tests that are of particular interest to the medical specialties. While this book was primarily intended for the practitioner, it will be found valuable by interns and medical students. It is surprising how much essential information the author has been able to include in this concise presentation. In addition to the main body of the text there are tables of normal standards of the various tests, outlines on indications of the tests, and valuable data on standard and percentage solutions, weights and measures, and general laboratory equipment. There are few books on the subject of laboratory medicine that offer such a wealth of information in such a comprehensive form.

E VON ESMARCH'S HYGIENISCHES TASCHENBUCH: Ein Ratgeber der praktischen Hygiene für medizinal- und verwaltungsbeamte Ärzte, Techniker, Schulmänner, Architekten und Bauherren. Herausgegeben von Dr. H. Reichenbach, o. ö. Professor der Hygiene in Göttingen. Fifth edition. Cloth. Price, 19.80 marks. Pp. 452. Berlin: Julius Springer, 1930.

This volume, now in its fifth German edition, is a textbook of sanitation and hygiene to which various authorities have contributed. The chapters deal with climate, housing, ventilation, heat, light, water, sewage, hospitals, schools, industry, nutrition, infectious diseases and disinfection. The book is exceptionally complete and contains a vast amount of important data. It is, in every sense of the word, a practical guide to its subject. Much of the material is in outline form.

HIGHER EDUCATION IN AMERICA. Edited by Raymond A. Kent, President of the University of Louisville. With an introduction by Lotus D. Coffman, President of the University of Minnesota. Cloth. Price, $3. Pp. 689. Boston: Ginn & Company, 1930.

In this volume a number of writers who are leaders in the field of education have combined to point out the nature of education in various fields and the method of control. Of particular interest to physicians are the chapters on medicine by Irving S. Cutter, dean of the Northwestern University Medical School, on dentistry by William J. Gies, and on student health by John Sundwall, professor of hygiene and public health at the University of Michigan. General educational chapters deal with such subjects as the selection of students, the college curriculum, graduate schools and university extension. The volume affords an exceedingly adequate survey of the present status of higher education in America. The chapter by Dr. Cutter, after a brief historical perspective, indicates the nature of the requirements of entrance to medicine, the nature of the curriculum, and the association of medicine with the hospital and the clinic. Dr. Cutter is apparently opposed to full time teachers, particularly in the clinical branches. He feels that the present medical course is too long and too detailed, and too costly. He points out that the primary fea-

tures of a medical education should be the development of logical thinking and judgment. The graduate in medicine must always remain a student with an inquiring type of intellect. For those interested in education generally, this volume constitutes a most valuable work of reference as well as a stimulator of interesting thought.

THE BOOK OF MY LIFE (DE VITA PROPRIA LIBER). By Jerome Cardan. Translated from the Latin by Jean Stoner. Cloth. Price, $3.50. Pp. 331, with a portrait. New York: E. P. Dutton & Company, Inc., 1930.

Cardano was born in Italy in 1501. He grew up in the period of Cellini. The book of his life is one of those fascinating autobiographies that tells almost everything. He was mentally eccentric but philosophically interesting if not sound. In the field of medicine he credits himself with certain definite contributions. Thus, he says:

> To the art of medicine I have contributed the true reckoning of the duration of the crisis in diseases; a general relief for gout and for pestilential fevers; the manifold transmutations in oils; how from medicines not purgative to prepare cathartics; a treatise on the special properties of waters. I have discovered many a useful method of preparing food; also a way to convert medicines of little medicinal value into useful and ready remedies, and such as are extremely distasteful into remedies easily administered. I have a remedy which so efficaciously relieves and strengthens a person suffering with dropsy that he may go about his business in the city on the same day.
>
> This likewise is my discovery, how from a comparison of the cures of one member and another, some understanding of the causes of the disease and method of treatment may be deduced; and I have shown how in a repeated study of one book—three or four readings—an understanding and method of treatment of divers diseases may be obtained. The true and shorter procedure of operating for hernia was called back into common usage through my efforts. I wrote a trustworthy history of urinary diseases, since we possess only certain obscure remains of these studies.
>
> A commentary on the most difficult books of Hippocrates has been prepared by my hand, particularly of those books judged authentic. The work is not yet completed on this day in which I write these words, that is, November 16, 1575.
>
> Besides these, I have collected a mass of material on the mal français, and brief results of experiments pertaining to several diseases very difficult to treat, epilepsy, insanity, blindness. My findings, for instance, concerning the use of equisetum for dropsy is included in this collection. I have elsewhere set down my numerous discoveries pertaining to scirrhosis, to excessive desire to urinate, to diseases of the joints, to gravel in the kidneys, to colic, haemorrhoids, and other diseases — about five thousand suggestions for treatment, all told. Of problems solved or investigated I shall leave something like forty thousand, and of minutiae two hundred thousand, and for this that great light of our country used to call me "The Man of Discoveries."

His book includes a bibliography of his own writings. For both fact and fantasy the book compares favorably with the memoirs of Cellini.

DER MENSCH: VOM WERDEN, WESEN UND WIRKEN DES MENSCHLICHEN ORGANISMUS. Herausgegeben vom Deutschen Hygiene-Museum. Schriftleitung: Dr. Med. Martin Vogel, Wissenschaftlicher Direktor. Teil 1 und Teil 2. (In one vol.). Cloth. Price, 47 marks. Pp. 420, with 412 illustrations. Leipzig: Johann Ambrosius Barth, 1930.

This volume is an outgrowth of the famous museum of hygeine. It includes chapters by numerous authorities covering the structure and development of the human body, divided into various systems, and illustrated by the most graphic illustrations available in any work of this kind. Indeed, the illustrations are in themselves worth more than the price of the book, thus making it valuable even to those who do not read German. The German text has evidently been written with a view to easy reading but certainly would not be understandable even if translated directly into English by the average American reader. Because of the quality of the illustrative material, the book almost demands American production with not only a translation but a rewriting of the German text in easily understandable terms.

RECENT ADVANCES IN ANALYTICAL CHEMISTRY. Volume I: Organic Chemistry. Edited by C. Ainsworth Mitchell, M.A., D.Sc., F.I.C. Cloth. Price, $3.50. Pp. 421, with 25 illustrations. Philadelphia: P. Blakiston's Son & Company, Inc., 1930.

The advances in the application of the methods of analytic chemistry to the various branches of industry and to the application of special branches of science in the last decade have been many. The present volume is intended to summarize briefly the methods in use up to about ten years ago and in more detail the advances in the last decade. The editor has obtained the collaboration of experts in each field covered in the volume, which insures for the reviews a note of authority. The headings of the eleven chapters give an indication of the scope of the work; they are on sugar analysis, oils and fats, essential oils, the proteins and biologic analysis of the proteins, tannins, cereals, milk and milk products, paper, petroleum and its hydrocarbons, and coal and gas analysis. Of interest to the medical chemist are the chapters on sugar analysis, oils and fats, the proteins, and milk and milk products. The first and third of these offer compact and concise summaries and criticisms of prevailing methods of sugar analysis and protein analysis, physically, chemically and biologically and point out in what direction future progress lies. The conciseness of the chapter on sugar analysis should be welcomed by those who have had occasion to look into the advantages of manipulation and accuracy claimed by the proponents of the many methods now extant.

HISTAMIN: SEINE PHARMAKOLOGIE UND BEDEUTUNG FÜR DIE HUMORALPHYSIOLOGIE. Von W. Feldberg, und E. Schilf am physiologischen Institut der Universität, Berlin. Band XX: Monographien aus dem Gesamtgebiet der Physiologie der Pflanzen und der Tiere. Herausgegeben von M. Gildemeister, R. Goldschmidt, usw. Paper. Price, 48 marks. Pp. 582, with 86 illustrations. Berlin: Julius Springer, 1930.

The authors of this work have not only compiled an extensive and representative literature on histamine but have included every ramification in connection with histamine-like substances and actions. The work is exceedingly well organized and is presented in a critical manner. The main divisions of the book are: (*a*) The chemistry, detection, determination, formation, and occurrence of histamine; (*b*) the general pharmacology; (*c*) the special pharmacology; (*d*) the action of histamine-like substances. The work is so well done and so comprehensive that a worker in any of the numerous fields involved is well repaid in reading it.

PHYSIOLOGICAL CHEMISTRY: A TEXT-BOOK AND MANUAL FOR STUDENTS. By Albert P. Mathews, Ph.D., Carnegie Professor of Biochemistry, the University of Cincinnati. Fifth edition. Cloth. Price, $7 net. Pp. 1233, with 109 illustrations. New York: William Wood & Company, 1930.

This is quite similar in general content and arrangement of material to the previous edition. The changes are scarcely apparent if one casually examines the book, but a perusal of the text will show that a considerable number have been effected without altering the appearance of the book to any great extent. The author has tried to bring his work to date by the addition of material on the more recent important advances in the subject. In this, of course, he is only partially successful, because of the rapidity with which knowledge in the biologic sciences now increases. In general, the discussion of new material is brief, but considerable space is given to the recent work on the structure of the blood and bile pigments, the nucleic acids, and the chemistry of glandular products and vitamins. The lists of references that accompany each chapter have been completed to 1930. The references have been well chosen to supplement the topics of the text, which of course have to be treated briefly in a work of this size. While the book is primarily a textbook, written for students, it will serve also as a valuable source book of information for those who do not wish to purchase one of the larger multiple volume treatises.

HANDBOOK OF ANATOMY BEING A COMPLETE COMPEND OF ANATOMY INCLUDING THE ANATOMY OF THE VISCERA, A SECTION ON SURGICAL ANATOMY, NUMEROUS TABLES, AND ADOPTING THE NEWER NOMENCLATURE DESIGNATED THE BASLE NOMENCLATURE COMMONLY CALLED B N A. By James K. Young, M.D., F.A.C.S. Revised by George W. Miller, M.D., F.A.C.S., Associate in Anatomy, Jefferson Medical College. Seventh edition. Leatherette. Price, $3.75. Pp. 460, with 154 illustrations. Philadelphia: F. A. Davis Company, 1930.

This is a "shorter anatomy" intended to lighten the work of medical and dental students preparing for examinations. It contains a considerable number of diagrams, tables and charts. The fact that seven editions have appeared in forty years is evidence of appreciation by the students. The text is essentially a tabulation. The charts and diagrams include extensive areas in one representation: this comprehensiveness makes them more valuable to students. In this edition the Basle nomenclature is used in its Latin form throughout the text, though not on the illustrations. If the legends on the illustrations also were revised, it would be a further improvement in the compendium.

A PRACTICAL MEDICAL DICTIONARY OF WORDS USED IN MEDICINE WITH THEIR DERIVATION AND PRONUNCIATION, INCLUDING DENTAL, VETERINARY, CHEMICAL, BOTANICAL, ELECTRICAL, LIFE INSURANCE AND OTHER SPECIAL TERMS; ANATOMICAL TABLES OF THE TITLES IN GENERAL USE, AND THOSE SANCTIONED BY THE BASLE ANATOMICAL CONVENTION; PHARMACEUTICAL PREPARATIONS, OFFICIAL IN THE U. S. AND BRITISH PHARMACOPŒIAS AND CONTAINED IN THE NATIONAL FORMULARY, AND COMPREHENSIVE LISTS OF SYNONYMS. By Thomas Lathrop Stedman, A.M., M.D. Eleventh edition. Leatherette. Price, $7.50 net. Pp. 1222, with illustrations. New York: William Wood & Company, 1930.

The modern medical dictionary assumes the proportions of an encyclopedia. It provides a liberal medical education for any one who cares to study it. It reflects advance in special fields through the adoption of official nomenclature available in those fields. The editor of Stedman's Dictionary is apparently a crusader for perfection in medical orthography. In his preface to the present edition he attacks spellings, particularly in the chemical field. He emphasizes the fact that some of his crusades have had success through adoption by THE JOURNAL. The reason for the change of spelling of alkaloids by the press of the American Medical Association was an attempt by the editor to secure uniformity through the adoption of official spelling established by learned societies.

Language is flexible, modified constantly by changes in usage. It is impossible to follow the classics as authorities since this would involve the use of diphthongs and other obsolete forms. There are at present three first class dictionaries available in the medical field. They vary in size, in the number of words included, in the nature of the type, in illustrations, in tables and charts, somewhat slightly in style, and in similar manners. They are all good dictionaries. The Stedman volume is probably the most complete.

HANDWÖRTERBUCH DER MEDIZINISCHEN PSYCHOLOGIE. Herausgegeben von Dr. Karl Birnbaum, a. o. Professor an der Universität, Berlin. Paper. Price, 46 marks. Pp. 672. Leipzig: Georg Thieme, 1930.

This is essentially an encyclopedia of medical psychology prepared by numerous writers. It covers the entire field of character, constitution, sensation, and normal and abnormal psychology. It is valuable not only as a reference work but as a volume for orientation and reading in this field.

CANCER OF THE LUNG AND OTHER INTRATHORACIC TUMOURS. By Maurice Davidson, M.A., M.D., B.Ch., Physician to the Brompton Hospital for Consumption and Diseases of the Chest. With a foreword by Arthur J. Hall, M.A., M.D., D.Sc., Professor of Medicine in the University of Sheffield. Cloth. Price, $5.50. Pp. 173, with 62 illustrations. New York: William Wood & Company, 1930.

In the first chapter the author calls attention to the fact that the increase in cancer of the lung is not only absolute but relative. He has arranged his statistics in a clear and convincing manner. In following chapters he deals with the pathology, diagnosis and treatment. One chapter is devoted to the radiologic aspects of neoplasms. The book is well illustrated and the short, simple descriptions should make it a popular work for any one interested in a brief summary of the subject.

LEHRBUCH DER MUND- UND KIEFERCHIRURGIE. Von Prof. Dr. Erich Sonntag, a. o. Planmässiger Prof. der Chirurgie und Direktor des Chirurgisch-Poliklinisch Instituts der Universität Leipzig, und Prof. Dr. Wolfgang Rosenthal, a. o. Professor der Chirurgie an der Universität Leipzig. Paper. Price, 24 marks. Pp. 444, with 501 illustrations. Leipzig: Georg Thieme, 1930.

This book is a satisfactory answer to the increasing desire for more information concerning surgery of the mouth and jaw. It is designed for the general practitioner and student in both medicine and dentistry rather than for the oral surgeon because, as is stated in the introduction, "operating technic is acquired, not out of books, but in the operating room and at the bedside." It is based on material and methods studied and in use at the surgical institute of the University of Leipzig; on this account the surgical technic recommended in some instances is not that in use in other places. This is particularly true with respect to the treatment of fractures. With extremely few exceptions, the illustrations are entirely original; they add materially to the clear presentation of the subject matter. The first 106 pages deal with general surgical principles, such as asepsis, anesthesia, blood conservation, control of hemorrhage and the management of wounds. The remainder has to do with mouth surgery and is divided into four sections: malformations and deformities, tumors, inflammations and diseases of the soft tissues, and finally injuries, especially fractures of the jaw. The index is complete; there is no bibliography.

TWENTY-ONE AMERICANS: BEING PROFILES OF SOME PEOPLE FAMOUS IN OUR TIME, TOGETHER WITH SILLY PICTURES OF THEM DRAWN BY DE MISKEY. By Niven Busch, Jr. Cloth. Price, $2.50. Pp. 332, with illustrations. Garden City: Doubleday, Doran & Company, Inc., 1930.

The sketches in this volume have practically all appeared in the *New Yorker*. They are written with the intimacy that characterizes most of the material in that erudite publication. They have appeared at various times since 1927. The one of chief interest to physicians is the sketch of John F. Erdmann. It begins, singularly enough, with an apology because of the fear that the mere writing of it will get the doctor into trouble ethically. Mr. Busch classes Dr. Erdmann among the first ten surgeons of the United States. Other sketches in the volume include such persons of near medical interest as Henry Ford and Walter Hagen.

RIDDERS OF THE PLAGUES: THE STORY OF THE CONQUEST OF DISEASE. By James A. Tobey, Doctor of Public Health. Cloth. Price, $3.50. Pp. 348, with illustrations. New York: Charles Scribner's Sons, 1930.

Dr. Tobey has written much in the field of public health. He collects here numerous essays covering the plagues of the past, the history of sanitation, the lives of Pasteur and Florence Nightingale, the development of the modern public health movement, and personal hygiene. His fact material has apparently been assembled from reliable authorities. Unfortunately, he is unable to make his story live, perhaps because his mind is more scientific than journalistic. All books of this character are inevitably compared with DeKruif's "Microbe Hunters," and because of the sense of the dramatic in that book all of them suffer by contrast. Unfortunately, the proof reading of this volume has not been careful, so that in some places the punctuation and the grammar are atrocious. The general reader in the field of health will find much in the volume that will interest him.

SANATORIUM. By Donald Stewart. Cloth. Price, $2.50. Pp. 306. New York: Harper & Brothers, 1930.

Many novels have been written dealing with the life of the tuberculous. The book by Thomas Mann called the "Magic Mountain" is no doubt supreme in this field. None of these books are suitable for a person with tuberculosis or even for the hypochondriac who fears he has the condition. The present book is no exception. It is realistic but morbid. Its ideal audience includes physicians and nurses whose occupations keep them in constant contact with patients who have the disease. They will find in the revelations in this novel much that will aid them in doing more for the sick.

HISTOLOGY FOR MEDICAL STUDENTS. By H. Hartridge, M.A., M.D., Sc.D., Professor of Physiology, University of London, at St. Bartholomew's Medical College, and F. Haynes, M.A., Demonstrator of Histology, University of London, at St. Bartholomew's Medical College. Cloth. Price, $5. Pp. 369, with 512 illustrations. New York: Oxford University Press, 1930.

This book is intended for use in elementary classes in histology and microscopic anatomy in which sections are issued for study with a microscope. It is excellently adapted to its purpose. It is illustrated by drawings made from sections; nearly all are colored, and the colors are those of the stains commonly employed, usually hematoxylin and eosin. Brief practical accounts of microscopes and of microscopic apparatus are illustrated by diagrams. The common methods of fixation, staining and mounting are outlined. One author is a physiologist, the other a demonstrator of histology, and the correlation of structure and function is clearly set forth. The text is admirably lucid, though brief. Elementary students and teachers should find the work practical and satisfactory.

PERSPEKTIVEN DER SEELENHEILKUNDE. Von Arthur Kronfeld. Paper. Price, 25 marks. Pp. 384. Leipzig: Georg Thieme, 1930.

This is intended to touch lightly on the various practical problems of psychology both normal and abnormal, to indicate certain problems, and to point the way toward further investigation. Few data are given on any individual chapter in psychology, but on the whole the monograph is of great interest.

Medicolegal

Revocation of License for Employment of Solicitors

(State ex. rel. Ball v. State Board of Health (Mo.), 26 S. W. (2d) 773)

A complaint was filed with the Missouri state board of health, charging Dr. S. E. Ball with unprofessional conduct in that he unlawfully solicited patronage, by agents. Ball was licensed to practice medicine and surgery in Missouri. He admitted that paid runners or agents met all trains coming into Excelsior Springs and solicited business, but he contended (1) that such soliciting was for board, rooms and baths, and not for patients, and (2) that the soliciting was done, not for him, but for the Health Culture Company. The board, however, revoked Ball's license. On a writ of certiorari the Circuit Court of Caldwell County quashed the order of the board and ordered it to restore the license. From the judgment of the court, the board appealed to the Supreme Court of Missouri.

Ball contended that the order revoking his license was void because it was not made at a legal meeting of the state board of health. Section 5776 of the Revised Statutes of Missouri, 1919, provides that meetings of the board shall be held in January and July of each year and at such other times as the board may deem expedient, and that four members shall constitute a quorum. It is true, said the Supreme Court, that it does not appear how or by whom the meeting was called at which Ball's license was revoked, but the fact that the record does not show the call does not necessarily render the meeting illegal or unauthorized. The record shows that the meeting was a called meeting and that six out of the seven members of the board were present. The board had authority to call the meeting. In the absence of evidence to the contrary, it should be and was presumed that the meeting was legally and properly convened.

The evidence showed that the Health Culture Company, for which Ball claimed the soliciting was done, was a corporation in name only. Its subscribed capital stock was paid up by transferring to it the property and equipment used in connection with "Dr. Ball's Health School," which was merely the trade-name of a sanatorium operated by Ball. Ball was the president and his wife the secretary of the Health Culture Company. Together they owned 93 per cent of its stock. The evidence showed that the runners who met incoming trains were licensed as solicitors for the Health Assurance Association, organized as a benevolent corporation, the business of which was financed by Ball's Health Culture Company, but they were paid with money furnished by the Health Culture Company. Even after the transfer of the property and equipment of "Dr. Ball's Health School" to the Health Culture Company, Ball continued to control its policies and to direct its operations, and to solicit business for it by agents exactly as he did before the incorporation of the Health Culture Company. The evidence warranted the conclusion, said the Supreme Court, that Ball was in fact the owner and operator of the sanatorium and was attempting to use the charter of the Health Culture Company as a shield to cover his own private activities. Ball, not the corporation, was in fact operating the sanatorium.

In support of Ball's contention that the solicitation by the paid runners was solicitation for board, rooms and baths, evidence of runners was offered. One of them testified that Ball had explained that his purpose in getting one or two rooming houses, aside from the sanatorium, was to make it possible legally to solicit for rooming houses and light housekeeping rooms, in order to get hold of people at the railroad station without arousing their suspicions as to just where they would be taken after they were gotten into the cabs. Probably many of them would not want to go to an institution or sanatorium, but by soliciting them for rooms and private housekeeping places, their objections could be avoided. A person yielding to the solicitation of the runners would be put into a car and taken to Ball, who would take the case history, examine him, and "land him if he was a good case." Ball testified that he had instructed his solicitors never, under any circumstances, to solicit patients for professional services. There was conflict in the evidence, said the Supreme Court, as to the purpose of solicitation, but this merely presented an issue of fact for determination by the board and warranted the conclusion that Ball, through paid agents, was soliciting patients.

Ball contended further that even if the purpose of solicitation was to get patients for treatment, no law was violated, because, he alleged, all patients coming to the sanatorium were treated by osteopaths in the employ of the Health Culture Company and there was no law prohibiting the solicitation of patients for osteopathic treatment. While Ball's evidence, said the Supreme Court, and the evidence of witnesses offered by him, tended to show that he did not examine, prescribe for or treat patients, the board evidently did not believe the testimony, in the face of substantial evidence to the contrary. The evidence as a whole warranted the conclusion that Ball was practicing medicine and that he solicited patronage by agents within the meaning of the law.

Finally, Ball contended, the order of the board revoking his license was void because it did not affirmatively show that a majority of the members of the board were satisfied that he was guilty and because it did not fix the period for which the license was revoked. The statute, said the Supreme Court, does not require that the record show affirmatively that a majority of the board find an accused licensee guilty of the offense charged against him. It requires only that the board revoke the license in the event a majority is satisfied that the licentiate is guilty. Six of the seven members of the board heard the evidence and unanimously voted to revoke Ball's license. An order to that effect was entered of record. It must be presumed, therefore, that the board obeyed the mandate of the statute and revoked the license because it was satisfied from the evidence heard that Ball was guilty of the offense charged.

It was not necessary in the present case, said the court, that the record show affirmatively that the board found Ball guilty, as a prerequisite to the issue of an order revoking his license. Neither was it necessary for the order to set a period of time for which the license was revoked. The statute provides that licenses shall be revoked for such periods of time as may be agreed on. The board may order a license to be revoked for a limited period or for all time. Where, as here, the order revoking the license does not name any specific period, it necessarily means a permanent revocation.

For the reasons stated, the Supreme Court quashed the judgment of the trial court ordering the restoration of Ball's license and sustained the action of the state board of health in revoking that license.

Mental Suffering Implied.—The rule seems to be well established that, where the pleading shows the injury sustained and the evidence shows the injury to be serious and probably permanent, the jury may consider mental suffering, if any. When the evidence shows physical pain and suffering for more than a year up to the time of the trial and that the physical condition will probably continue for an indefinite time, with the probability of an operation, mental and physical pain will be implied with the continued illness.—*Dallas Railway and Terminal Co. v. Davis (Texas), 26 S. W. (2d) 340.*

Society Proceedings

COMING MEETINGS

American Association of Anatomists, Chicago, April 2-4. Dr. George W. Corner, University of Rochester School of Medicine, Rochester, N. Y., Secretary.

American Association of Pathologists and Bacteriologists, Cleveland, April 2-3. Dr. H. T. Karsner, 2085 Adelbert Road, Cleveland, Sec'y.

American College of Physicians, Baltimore, March 23-27. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Executive Secretary.

American Orthopsychiatric Association, New York, February 20-21. Dr. George S. Stevenson, 370 Seventh Ave., New York, Secretary.

Pacific Coast Surgical Association, Victoria, British Columbia, February 27-28. Dr. E. L. Gilcreest, 384 Post Street, San Francisco, Secretary.

Southeastern Surgical Congress, Atlanta, Ga., March 9-10. Dr. B. T. Beasley, 45 Edgewood Ave., Atlanta, Ga., Secretary.

Tri-States Medical Association of Mississippi, Arkansas and Tennessee, Memphis, February 17-20. Dr. A. F. Cooper, Bank of Commerce Bldg., Memphis, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

6: 163-308 (Dec.) 1930

*Rôle of Syphilis in Etiology of Angina Pectoris, Coronary Arteriosclerosis and Thrombosis, and of Sudden Cardiac Death. A. S. Warthin, Ann Arbor, Mich.—p. 163.
*Pathogenesis of Brown Induration of Lung. E. Moschcowitz, New York.—p. 171.
*Auricular Fibrillation as Only Manifestation of Heart Disease. W. M. Fowler and C. W. Baldridge, Iowa City, Iowa.—p. 183.
*Changes in Circulation Following Birth. B. M. Patten, Cleveland.—p. 192.
Reversal of Flow in Cardiac Veins. O. V. Batson and S. Bellet, Philadelphia.—p. 206.
*Postural Hypotension. H. H. Riecker and E. G. Upjohn, Ann Arbor, Mich.—p. 225.
Cardiac Anomaly (Double Left Auricle). G. A. Palmer, Cleveland.—p. 230.
*Qualitative Comparison of Various Digitalis Bodies. H. Gold, W. Hitzig, B. Gelfand and H. Glassman, New York.—p. 237.
*Heart in Thrombo-Angiitis Obliterans. S. S. Samuels and S. C. Feinberg, New York.—p. 255.
*Heart Disease in Rocky Mountain Region. L. E. Viko, Salt Lake City.—p. 264.
Aneurysm of Thoracic Aorta. E. C. Reifenstein and E. G. Allen, Syracuse, N. Y.—p. 274.

Rôle of Syphilis in Etiology of Angina Pectoris and Coronary Thrombosis.—Warthin analyzes 1,675 necropsies on individuals over 25 years of age. Of this number, 408 males and 86 females showed the microscopic lesions of active latent syphilis. In about 50 per cent of cases the presence of *Spirochaeta pallida* was demonstrated. The highest incidence of these lesions was found in the aorta, in 97.6 per cent of cases for the first decade, 1909 to 1919, and in 86.3 per cent of cases for the second decade, 1919 to 1929. In 169 cases of syphilis (1909 to 1919) there were 53 cases of coronary sclerosis without thrombosis, 9 cases of syphilitic disease of the coronaries, 1 case of coronary thrombosis and sclerosis, and no case with a clinical history of angina pectoris. In this decade there were 13 cases of sudden death without previous anginal history, in the 169 cases of syphilis. Nine of these cases showed marked coronary sclerosis without evidence of syphilitic coronary involvement; 4 cases showed the lesions of coronary sclerosis and syphilis. In 9 of these cases there was a diffuse interstitial myocarditis of the syphilitic type; in only 4 was there a microscopic picture of myocardial infarction. In the decade 1919 to 1929, in the 332 cases of latent syphilis there were 172 cases of coronary sclerosis, and 55 cases showing syphilitic lesions of the coronaries, including 1 case of gummatous coronary arteritis. In this group there were 5 cases of coronary occlusion by thrombosis; 4 of these were associated with coronary sclerosis alone, and 1 with syphilis of the coronary. There were 6 cases of angina pectoris in this group; 5 of these were associated with coronary sclerosis alone, 1 with syphilis of the coronary main branches. There were 25 cases of sudden death in this decade in the syphilitic group; in 13 of these the coronaries showed arteriosclerosis alone; in 12 cases there were lesions of syphilis in the coronaries, 6 of which showed both syphilis and sclerosis. Eleven of the cases of sudden death showed myocardial infarction; 14 showed no infarction, but the picture of a chronic diffuse interstitial myocarditis with fibrosis. Five of the cases of myocardial infarction were associated with occlusion due to coronary sclerosis alone; 6 were associated with both sclerosis and lesions of syphilis. Comparing the nonsyphilitic cases coming to necropsy during the same two decades, in 1,174 nonsyphilitic necropsies there were 412 cases of coronary sclerosis, with 6 cases of well defined clinical angina pectoris, 8 cases of coronary thrombosis and 8 cases of myocardial infarction. In 2 cases, sudden death from coronary thrombosis and myocardial infarction occurred without a history of angina.

Pathogenesis of Brown Induration of Lung.—A case is reported by Moschcowitz in which the lesions of brown induration of the lung were found consequent to a prolonged asthma. Under observation, the patient presented the transition from a purely functional bronchial asthma to emphysema, to a pure clinical example of hypertension of the pulmonary circulation and finally to death from failure of the right heart.

Auricular Fibrillation as only Manifestation of Heart Disease.—In seven of the ten cases reported by Fowler and Baldrige the auricular fibrillation was paroxysmal, while in three it had persisted for periods of two weeks, five months and two and one-half years, respectively. In each of the latter instances, sinus rhythm was restored by quinidine. The patient who had auricular fibrillation for two and one-half years later came to necropsy, and the heart was regarded as grossly and microscopically normal. One case of auricular fibrillation was attributed to the removal of cerumen from the external auditory canal, one to exertion, four to alcohol, one to carbon monoxide, one to ether and nitrous oxide anesthesia; two patients were in attendance at gasoline stations. In thirty-five cases collected from the literature the auricular fibrillation was attributed to such stimuli as electrical shock, diseases within the abdomen, emotion and effort, and intoxication by various chemical substances. Abdominal disease and alcohol were the most common exciting agents. In the former group it is believed that a reflex stimulation over the vagus contributed to the production of auricular fibrillation.

Changes in Circulation Following Birth.—The changes in circulation that take place following birth are thus summed up by Patten: Current conceptions as to the occurrence at the moment of birth of an abrupt rerouting of the blood in the heart and great vessels rest on insufficient evidence. There is an increasing reason to believe that the volume of blood circulating through the lungs at the close of fetal life is adequate to care for the respiratory demands of the new-born infant as soon as the lungs are properly ventilated and that no radical circulatory upheaval occurs at the time of birth. In the neonatal period, with the assumption of respiratory function, the volume and power of the pulmonary circuit gradually increase, bringing about, by the close of the first month, a new functional balance in intracardiac pressure. It is probable that under normal conditions the progressive closure of the ductus arteriosus accelerates the enlargement of the pulmonary vessels following birth, but there are many cases on record in which a normal pulmonary circulation has been established without closure of the ductus. With the establishment of the new interatrial equilibrium brought about by increase in pulmonary circulation, the foramen ovale falls gradually into disuse. Anatomic obliteration of the foramen ovale follows slowly in the wake of its functional abandonment. Provided the valvula foraminis ovalis competently covers the foramen ovale, failure of the valve completely to fuse to the septum is no functional handicap as long as there is not an intercurrent disturbance elsewhere in the cardiovascular mechanism or in the lungs. This fusion is incomplete, leaving what might be termed a "probe patency" in about 20 per cent of all adults. Functional incompetence of the valvula by reason of defective development, which should be clearly distinguished from "probe patency," is as uncommon as other cardiac anomalies; failure of the ductus arteriosus to close within the normal time range is to be regarded as a symptom rather than a cause of circulatory dysfunction. Instances of the ductus remaining unclosed in the absence of abnormal conditions which force the maintenance of a blood current through it are exceedingly rare. Following the increase in pulmonary circulation and the closure of the fetal blood passages there is a gradual increase in the left ventricular musculature to equal the right at about three to five months, acquiring a definite preponderance by the second year and its full adult degree of preponderance by about the seventh year.

Postural Hypotension.—A case of postural hypotension in a man aged 60 is reported by Riecker and Upjohn in which arteriosclerosis and a lowered vital capacity were prominent. The pathologic physiology in this case seems to be a greatly reduced stroke volume of the heart induced by failure of the

vasomotor nervous center to respond to the hydrostatic effect of the standing posture. The clinical picture now is well established and permits recognition of the disease from the history. The essential points are the complaint of dizziness on changing the position of the body from supine to erect and the prompt relief of the dizziness on resuming a reclining posture. This may vary from slight vertigo to actual fainting. The diagnosis is confirmed by blood pressure readings in the two positions. Certain other associated symptoms seem sufficiently common to be included in the symptom complex. These are a marked pallor of the face during the attack, with temporary blurring of vision and involuntary closing of the eyes. The hands and feet become cyanotic during the erect posture. There are also numbness, tingling, and slight convulsive jerking of one of the arms, frequently associated with sweating of the limb. The jerking movement is not unlike that seen in the Stokes-Adams syndrome or carbon monoxide poisoning, and might be mistaken for an epileptiform seizure should fainting occur. Weakness, ease of fatigue, and dyspnea on exertion are common. It has been noted that patients feel more uncomfortable during the summer months.

Qualitative Comparison of Various Digitalis Bodies.—Experiments were carried out by Gold et al. with six widely different members of the digitalis group in order to ascertain whether these showed any qualitative differences in the cardiac action. Electrocardiographic criteria of digitalis action were used, and the relative intensity of action on different cardiac structures (in relation to the fatal dose) was used to indicate qualitative differences. The results show that widely different digitalis bodies have the same qualitative cardiac actions but that there are extraordinary individual differences in response to the same preparation. This fact may be an important factor in the confusion found in the clinical literature. There are numerous references in the literature to qualitative differences in the cardiac action of different members of the digitalis group, and implications that such differences exist are common in commercial advertisements; but in no single instance are these statements substantiated by adequately controlled experiments. Examples are cited showing some of the sources of error in the interpretation of observations that appear to indicate qualitative differences in the cardiac action of different digitalis bodies.

Heart in Thrombo-Angiitis Obliterans.—Fifty cases of thrombo-angiitis obliterans were studied by Samuels and Feinberg from the standpoint of involvement of the coronary artery. Five of these cases showed definite clinical and electrocardiographic evidence of myocardial damage, presumably due to lesions of the coronary artery. Thirty cases showed minor evidence insufficient for the diagnosis of injury to the coronary artery. Fifteen cases showed no clinical evidence of myocardial or coronary artery lesions.

Heart Disease in Rocky Mountain Region.—Viko studied 1,000 cases of heart disease occurring in the Rocky Mountain states. In comparison with other states, the incidence of rheumatic heart disease seemed relatively high. It is suggested that this may be partly due to the age distribution of the population. The incidence of thyroid heart disease is high in contrast to other sections. The incidence of syphilitic heart disease is low, possibly the result, at least partly, of the small Negro population. The incidence of rheumatic heart disease seemed significantly higher in urban than in rural patients. No peculiarities in the etiology of heart disease were found that could be ascribed to the unique geographic or climatic conditions of this region except the high rheumatic and thyroid incidence.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

11: 649-706 (Dec.) 1930

Radiation Treatment of Cancer of Uterine Cervix. A. F. Tyler, Omaha.—p. 649.
Pelvic Diathermy. G. Gellhorn, St. Louis.—p. 654.
Ultraviolet Radiation in Management of Corneal Ulcers. O. B. Nugent, Chicago.—p. 660.
*Medical Diathermy in Treatment of Hemorrhoids. D. Kobak, Chicago.—p. 665.
Colon: Factor in Disease. H. W. Rotham and O. B. Schellberg, New York.—p. 668.

Medical Diathermy in Treatment of Hemorrhoids.—Kobak asserts that, while surgery must frequently be resorted to, careful selection of cases for treatment with medical diathermy will often avert or defer surgical intervention. In those patients in whom surgery is for some reason contraindicated, the method suggested by Kobak is said to be a noteworthy advance in hemorrhoid therapy.

Iowa State Medical Society Journal, Des Moines

20: 539-586 (Dec.) 1930

Similar Eye Signs and Symptoms in Exophthalmic Goiter and Lethargic Encephalitis. G. F. Suker, Chicago.—p. 539.
Outstanding Problems of Student Health. G. E. Williams, Iowa City.—p. 543.
Intestinal Obstruction. D. C. Conzett, Dubuque.—p. 547.
Trend of Modern Obstetrics. W. E. Brown, Cedar Rapids.—p. 550.

Johns Hopkins Hospital Bulletin, Baltimore

47: 309-395 (Dec.) 1930

Amyotonia Congenita (Oppenheim's Disease) in Identical Twins. W. D. Forbus and F. S. Wolf, Baltimore.—p. 309.
*Conclusions Drawn from One Thousand Forceps Deliveries. H. J. Stander, Baltimore.—p. 323.
*Pathogenesis of Forms of Jaundice. A. R. Rich, Baltimore.—p. 338.
Cervical Adenitis Due to Bacillus Fusiformis: Case. W. M. Fiore, Baltimore.—p. 378.
*Acetone Bodies in Normal Pregnancy and in Toxemias of Pregnancy. H. J. Stander and J. F. Cadden, Baltimore.—p. 382.

Conclusions from One Thousand Forceps Deliveries.—Stander asserts that the conservative use of forceps is a means of saving the lives of many infants; nevertheless, the fetal mortality is higher than is usually appreciated. Low forceps constitutes over 80 per cent of all forceps delivery, while high forceps was performed in less than 2 per cent of the cases. Uterine inertia or prolonged second stage of labor accounts for over half the forceps operations. Forceps delivery is necessary four times more frequently in primiparous than in multiparous patients. Contracted pelvis occurs more than twice as frequently in the Negro as in the white patient. It is a considerable factor in the indication for forceps, since it not only includes contraction of the pelvic outlet due to funnel pelvis but also plays a considerable part in the production of uterine inertia, in patients who are subjected to a test of labor. The gross fetal mortality incident to forceps delivery is 10 per cent. The fetal mortality in Negro primiparas is 17.4 per cent and constitutes the most important single factor in the production of the high gross mortality in forceps delivery. The fetal death rate is definitely increased by failure of rotation in posterior presentations and is particularly high when the head is arrested in deep transverse. The duration of labor is a very important factor in increasing the fetal mortality incident to forceps delivery. After forty-eight hours the fetal death rate becomes excessively high. Only one fifth of patients delivered by forceps had no perineal lacerations. As tears are far more frequent in primiparas, primiparity may be an argument in favor of routine episiotomy. Experience shows that the Negro woman is about twice as poor a risk as to both morbidity and mortality as the white patient. The cephalic application of the blades is essential to the proper performance of forceps delivery. The high incidence of obliquely posterior and of deep transverse presentations makes it inadvisable to apply the blades to the sides of the pelvis; and it is to neglect of this precaution that the great dread of such presentations is due. The fetal heart in utero does not always afford satisfactory information as to the condition of the child, and this should be borne in mind especially when forceps are applied in women who have been in labor for more than thirty-six hours. The fetal mortality is higher in primiparas than in multiparas, and this is particularly true for forceps delivery in the primipara under 20, as well as in the primipara over 35 years of age.

Pathogenesis of Forms of Jaundice.—The various forms of jaundice are considered by Rich in the light of present information regarding the physiology and pathology of the formation and excretion of bile pigment. It is pointed out that, from the standpoint of the clinical and pathologic evidence, cases of jaundice are separable, on the basis of pathogenesis, into two main types. The first type, retention jaundice, results from an overproduction of bile pigment, usually associated with conditions (anoxemia, fever, immaturity) that tend to render the excretory power of the liver subnormal; enough bilirubin is therefore retained in the blood to stain the tissues. This form of jaundice is characterized clinically by (1) indirect-reacting

plasma bilirubin, (2) increased amounts of fecal urobilin, and (3) urobilinuria. Pathologically, the ducts are patent, but the liver cells may show atrophy or cloudy swelling, depending on the associated condition of which the jaundice is a symptom. The second type, regurgitation jaundice, is caused by the reflux of whole bile from the canaliculi into the blood stream. This type is characterized clinically by (1) direct-reacting plasma bilirubin, (2) subnormal amounts of fecal urobilin, and (3) the presence of bilirubin and bile salts in the urine. The pathologic basis of this form of jaundice is rupture of the canaliculi resulting from obstruction of the ducts or from necrosis of the hepatic cells. Combined forms may occur, as well as a transition from one of these types of jaundice to the other. A classification is offered in which the two types (retention jaundice and regurgitation jaundice) are further subdivided from the standpoint of etiology and pathogenesis, and the reasons for the various subdivisions are discussed.

Acetone Bodies in Normal Pregnancy and in Toxemias of Pregnancy.—Stander and Cadden show that the toxemias of pregnancy, low reserve kidney and nephritis complicating pregnancy are associated with a tendency toward an accumulation of acetone bodies in the blood, while in eclampsia there is a definite hyperacetonemia which probably helps in the production of the uncompensated alkali deficit so often seen immediately after a convulsion. Their figures do not reveal a hyperacetonemia in normal pregnancy, although both uncorrected and corrected acetone values are above the average for normal nonpregnant women. It seems that a disturbance in the oxidation of fatty acids may take place more readily in pregnant than in normal nonpregnant women, with the production of ketone substances. This may in part explain the lowered alkali reserve in the blood of pregnant women. A decrease in maternal carbohydrate, resulting from a drain on it by the fetus, or a change in the maternal fat metabolism, may be the cause of the ketosis. It appears probable that the metabolism of pregnant women may be helped by decreasing fat and increasing carbohydrate in their diet.

Journal of Experimental Medicine, Baltimore

52: 1-152 (Dec. 1) 1930

Reaction of Connective Tissue of Normal Rabbit to Lipoids from Tubercle Bacillus, Strain H-37. F. R. Sabin, C. A. Doan and C. E. Forkner, New York.—p. 3.

Reaction of Connective Tissues of Normal Rabbit to Water-Soluble Protein and Polysaccharide from Tubercle Bacillus, Strain H-37; Spontaneous Pseudotuberculosis Aspergillina as Complication in Fraction Testing. C. A. Doan, F. R. Sabin and C. E. Forkner, New York.—p. 73.

Derivation of Giant Cells, Especially Those of Tuberculosis. C. A. Doan, F. R. Sabin and C. E. Forkner, New York.—p. 89.

Relation of Tubercle and Monocyte-Lymphocyte Ratio to Resistance and Susceptibility in Tuberculosis. C. A. Doan and F. R. Sabin, New York.—p. 113.

Journal of Lab. & Clinical Medicine, St. Louis

16: 225-328 (Dec.) 1930

*Studies on Defecation; Medullary Defecation Center. T. Koppanyi, New York.—p. 225.

Antimony in Medicine. C. N. Myers and B. Throne, Brooklyn.—p. 239.

Phosphorus Partition in Normal Whole Blood. B. S. Walker and M. E. Huntsinger, Boston.—p. 247.

Phosphorus Metabolism: II. Distribution of Phosphorus in Normal and Cancer Bloods. G. E. Youngburg and M. V. Youngburg, Buffalo.—p. 253.

*Transfusion of Incompatible Blood Without Reaction, and Error Due to Contamination of Grouping Sera with Mustard Bacillus. E. F. Grove and M. J. Crum, New York.—p. 259.

*Congo Red Test: Excretion of Dye in Urine. N. W. Barker and A. M. Snell, Rochester, Minn.—p. 262.

Surface Heating with Two Types of Diathermy Electrodes. A. Hemingway, Minneapolis.—p. 271.

*Intradermal Test as Aid in Diagnosis of Undulant Fever. W. Levin, Portland, Ore.—p. 275.

Glass Particles: Breaking of Glass Ampules. S. O. Chambers, Los Angeles.—p. 282.

Fecometer of Simple Construction. R. J. Miller, State College, Pa.—p. 286.

*Proposed Chemical Test for Pyrogen in Distilled Waters for Intravenous Injections. E. R. Carter, Indianapolis.—p. 289.

Acetone as Yardstick for Ketosis. A. T. Brice, Florence, S. C.—p. 291.

Sterilization of Cystine Culture Medium Under Steam Pressure. F. W. Shaw, Richmond, Va.—p. 294.

Method for Reporting and Interpreting Leukocyte Count. F. Boerner, Philadelphia.—p. 296.

Significance of "Shift to the Left." in Differential Leukocyte Counts and Nuclear Index as Means for Interpreting and Recording: I. Nuclear Index of Normal Blood and Influence of Age. J. H. Gerard and F. Boerner, Philadelphia.—p. 300.

Id.: II. Nuclear Index in Disease. J. H. Gerard and F. Boerner, Philadelphia.—p. 306.

Technic to Facilitate Reading of Kahn Results in Hemolized, Highly Tinted or Cloudy Sera, and in Sera of Doubtful Reaction. B. S. Levine, Hines, Ill.—p. 310.

Apparatus to Facilitate Preparation of Fresh Frozen Sections. H. D. Caylor and T. E. Caylor, Bluffton, Ind.—p. 312.

Useful Coverslip Holder. S. A. Petroff, Trudeau, N. Y.—p. 314.

New Culture Flask. S. A. Petroff, Trudeau, N. Y.—p. 315.

Application of Quinhydrone Method for Determination of P_H Solid Medium. W. Steenken, Jr., Trudeau, N. Y.—p. 316.

Medullary Defecation Center. — Koppanyi conducted experiments on dogs to determine the effect of various drugs on the defecation center. He found that codeine, picrotoxin and heroin are centrally acting evacuants; the application of centrally acting evacuants to the floor of the fourth ventricle may elicit straining and defecation; lesions in the floor of the fourth ventricle, or application of morphine sulphate to the floor, may abolish the straining and defecation that follow the injection of centrally acting evacuants; afferent impulses for defecations may originate in the small intestine; the vagus nerve carries efferent impulses concerned in defecation of medullary origin; dogs that did not vomit from apomorphine and did not defecate following the administration of codeine failed to vomit following the injection of pilocarpine, digitalis and antimony and potassium tartrate but vomited on oral administration of local irritant emetics, antimony and potassium tartrate, zinc sulphate and mercuric chloride; the nature of the vomiting and defecation centers is discussed in the light of the experimental data obtained.

Transfusion of Incompatible Blood Without Reaction.—Grove and Crum report the case of an 8-year-old group O patient who was given a transfusion of 300 cc. of group B blood without at any time exhibiting the slightest reaction. The absence of symptoms was apparently due to the inability of the B iso-agglutinin to clump B corpuscles at body temperature. The transfused B corpuscles had completely disappeared by the seventh day. The transfusion of the incompatible blood was made on account of a mistake in the grouping of the patient due to contamination of the anti-B grouping serum with a "mustard bacillus," which produces a nonspecific agglutinating property for all human blood cells. A routine check of the usual method of grouping with known test serums is recommended, by testing the patient's serum against freshly obtained A and B corpuscles, and also against group O corpuscles.

Congo Red Test; Excretion of Dye in Urine.—Bennhold's congo red test as a specific clinical test for amyloidosis has been confirmed by Barker and Snell in four cases with forty-six controls. In the absence of albuminuria, congo red is excreted in the urine in traces or not at all. In fourteen cases of chronic lipoid nephrosis, congo red was excreted in the urine in relatively large amounts. In some cases of glomerulonephritis with edema, nephrosclerosis with albuminuria, and renal amyloidosis, congo red was excreted in the urine. In cases of nonedematous glomerulonephritis and chronic passive congestion of the kidneys with albuminuria, only traces, or none at all, of congo red were excreted in the urine. Cases in which definite amounts of congo red were excreted in the urine were usually those with (1) albuminuria of high degree; (2) serum proteins below 5 Gm. in each hundred cubic centimeters; (3) blood cholesterol above 200 mg. in each hundred cubic centimeters, and (4) edema of the renal type. Efforts to produce excretion of congo red in the urine in animals were not successful.

Intradermal Test as Aid in Diagnosis of Undulant Fever.—A number of definitely diagnosed as well as suspected cases of undulant fever were tested by Levin intradermally with abortus protein. Tests were made also on the patients in tuberculosis hospitals, in one of which an outbreak of undulant fever occurred, and on many normal persons. Of fifteen clinical cases of undulant fever, all gave positive intradermal tests. Fourteen patients with varying symptoms, but all giving histories of chills and sweats, and many pyrexias, gave negative intradermal reactions. With one exception all gave negative agglutination tests. A case later diagnosed influenza gave a positive agglutination test in 1:20 dilution. Three of the fourteen patients were subsequently diagnosed as having typhoid fever, and one lobar

pneumonia. Of ninety-four patients in one tuberculosis hospital, only one gave a reaction which might be interpreted as doubtful. Her agglutination test was negative. Of 169 patients in another tuberculosis hospital, seven gave distinctly positive reactions. Six of these reactors had been patients in the hospital in which there occurred an outbreak of undulant fever. At that time the whole hospital population and staff yielded forty-three who gave agglutination reactions in titers varying from 1:20 to 1:2,560, and five of these were reported as clinical cases. All six of the skin reactors had shown antiabortus agglutinins in 1928, and three had some agglutinins at the time the intradermal test was made. Twenty-one medical students were given the intradermal test. Two gave typically positive reactions. Both students were healthy and gave no history of past undiagnosed illness. Both had used raw milk exclusively up to about a year before. In the course of the routine physical examination of milk handlers a 22-year-old lad was found whose serum agglutinated *Brucella abortus* in a dilution of 1:160. He gave a positive intradermal reaction. Here again there was seemingly no history of past infection or undiagnosed illness, although he admitted having milked cows for the past five or six years. A 9-year-old girl with an undiagnosed illness of over one year's duration was given the intradermal test for undulant fever. She gave a very marked reaction. Her agglutination test was positive in a dilution of 1:40. Her history presented a classic picture of undulant fever infection. The milk used in this girl's home had always been pasteurized, and an attempt to link her infection with a visit to her grandfather's ranch six weeks prior to the onset of her illness failed when it was shown that no reactors had been found among the cattle at that ranch. It was found, however, that the girl visited a neighbor rather frequently and often drank milk there. The neighbor's child, a 9-year-old boy, also had had an undiagnosed illness of over a year's duration. He had been under observation as a suspected case of tuberculosis. He gave a very marked intradermal test for abortus. His serum, tested several times, failed to show any agglutinins for *Brucella*. His mother also gave a marked intradermal reaction for abortus, and an agglutination titer of 1:160. She gave a history of having had what she thought was influenza six months prior to the test and had been ill for several weeks with rheumatic pains. Both the mother and the boy drank raw milk in quantity. The milk was produced at a dairy where, out of forty cows tested, twelve were definite reactors and six were classified as suspicious. Thirty-three hospitalized children were given the intradermal test. Only one child gave a positive reaction. Her agglutination test was negative. She also gave a negative tuberculin test. The clinical diagnosis on this patient was sinusitis and mastoiditis.

Chemical Test for Pyrogen in Distilled Water for Intravenous Injections.—The method Carter proposes seems to indicate that distilled waters not discharging the color are free from pyrogens and, therefore, from febrile-producing organic substances. The test is performed by heating 100 cc. of distilled water in a clean pyrex beaker to boiling, acidulating with 10 cc. of dilute sulphuric acid (10 per cent), and adding 0.1 cc. of twentieth normal potassium permanganate. The color of the solution should not be destroyed by continuing the boiling for ten minutes. The method is offered with the hope that it will be tried widely in those hospital laboratories responsible for the safety of solutions intended for intravenous use.

Journal of Parasitology, Urbana, Ill.

17: 61-120 (Dec.) 1930

New Species of Oxysomatium (Nematoda): Genera Oxysomatium and Aplectana, Life History. P. D. Harwood, Houston, Texas.—p. 61.
Diplodiscus Intermedius, Sp. Nov., from Rana Catesbiana Shaw. G. W. Hunter, Middletown, Conn.—p. 74.
New Species of Bird Nematodes from Philippine Islands. E. E. Wehr. —p. 80.
Trichomonas Diversa N. Sp.; Association with Disease of Turkeys. F. Volkmar, Columbus, Ohio.—p. 85.
Eimeria Citelli, New Species of Coccidium from Striped Ground-Squirrel. J. A. Kartchner and E. R. Becker, Iowa State College.—p. 90.
Biology of Fourth Stage Larva of Oxyuris Equi (Schrank). R. Wetzel, Hannover, Germany.—p. 95.
Coccidia of Rodents: Eimeria Monacis, N. Sp. from Woodchuck. F. Fish. —p. 98.
New Species of Telorchis from Intestine of Clemmys Marmorata. L. G. Ingles, Bakersfield, Calif.—p. 101.
Nemic Parasite of Pecten. N. A. Cobb.—p. 104.

Michigan State M. Soc. Journal, Grand Rapids

29: 881-966 (Dec.) 1930

*Roentgenologic Studies of Urinary Tract with Contrast Agents Administered Intravenously. R. E. Cumming, Detroit.—p. 881.
Head Injuries. W. A. Bunten, Detroit.—p. 889.
Malnutrition in Children. H. C. Metzger, Detroit.—p. 896.
*Blood Pressure in Normal Pregnancy. H. C. Walser.—p. 899.
Is Writing of Prescriptions Becoming Lost Art? W. J. Cree, Detroit. —p. 901.
Relation Between Physician and Industry. H. S. Collisi, Grand Rapids. —p. 904.
Hodgkin's Disease: Diagnostic Difficulties; Results Following Roentgen Irradiation. G. A. Sherman, Pontiac.—p. 909.
*Mastoiditis Following Skull Fracture. R. K. Miller and F. A. Lauppe, Detroit.—p. 912.
Hepatic Amebiasis: Case. J. E. Watson, Detroit.—p. 914.
Treatment of Fractured Jaws. G. R. Maitland, Detroit.—p. 915.
*Tularemia in Michigan. J. L. Murphy, Ann Arbor.—p. 917.

Intravenous Urography.—The present-day conceptions of intravenous urography are outlined by Cumming in conjunction with personal observations extending over a period of six months. Fifty cases in which intravenous contrast mediums were employed are discussed in some detail. Certain types of renal disease promise little or no diagnostic evidence after the administration of these drugs, namely, renal tuberculosis, renal tumors, acute inflammations, and marked renal insufficiencies as portrayed by advanced prostatism. In an analysis of thirty-eight cases selected for adaptability to diagnosis by means of intravenous urography, Cumming says less than 50 per cent were found as completely solved even from the roentgenologic standpoint, and each patient was perforce subjected to later therapeutic cystoscopic procedures. The best visualizations were obtained in cases presenting some degree of ureteral obstruction and in cases showing delayed kidney evacuation time, as illustrated by a kidney with retarded function following nephropexy or nephrolithotomy. The greatest concentration of the drug occurs, in most cases, during the second hour following its administration.

Blood Pressure in Normal Pregnancy.—In 1,000 cases of normal pregnancy studied by Walser, the average blood pressure readings, both systolic and diastolic, were lower than those given in most textbooks. There is probably a slight increase in average blood pressure readings of pregnant women according to increase in age. Parity has little, if any, effect in increasing blood pressure in pregnancy. Three fourths of all normally pregnant patients have an average systolic blood pressure over 100. Many patients have a systolic blood pressure of less than 90 during pregnancy and, if the constitutional causes are excluded, no treatment is necessary. There is no reason for fearing shock after delivery because of the previous low level of the blood pressure.

Mastoiditis Following Skull Fracture.—Miller and Lauppe report a case of mastoiditis following fracture of the skull. Twenty-two similar cases were found in the literature. Recovery followed operation.

Tularemia in Michigan Not Endemic.—A case of tularemia of the ulceroglandular type is reported by Murphy. *Bacterium tularense* was isolated from a suppurating gland. This organism produced typical lesions in guinea-pigs and was agglutinated by the patient's serum. This case is the fifth reported in Michigan. So far, none of the reported cases have come from the rabbits of Michigan but from those shipped in from other states, such as Missouri, Tennessee and southern Illinois.

Pennsylvania Medical Journal, Harrisburg

34: 153-222 (Dec.) 1930

Acute Surgical Abdomen in Children. W. E. Ladd, Boston.—p. 153.
Torsion of Testicle: Four Cases. J. C. Birdsall, Philadelphia.—p. 159.
Nonspecific Prostatitis. J. McCahey, Philadelphia.—p. 162.
Skin Eruptions in Negro Child. E. F. Corson, Philadelphia.—p. 164.
Gastro-Intestinal Symposium: Evaluation of Various Methods of Gastric Analysis; Histamine Test. G. D. Gammon, Philadelphia.—p. 166.
Diagnostic Features of Cancer of Stomach. S. T. Nicholson, Jr., Philadelphia.—p. 169.
Precursors of Carcinoma of Stomach. T. G. Miller, Philadelphia.—p. 170.
Elements Underlying Progressive Axial Myopia. H. H. Turner, Pittsburgh.—p. 173.
Diseases of Cardiovascular System and of Lower Respiratory Tract. C. R. Austrian, Baltimore.—p. 178.
Goiter Prevention in Schools. J. B. McCreary, Harrisburg.—p. 189.
Vulvovaginitis in Children. A. S. McElroy, Pittsburgh.—p. 192.

Public Health Reports, Washington, D. C.

45: 3041-3104 (Dec. 12) 1930

Chemistry of Cell Division: 1. Effect of Glutathione on Cell Division in Ameba Proteus. C. Voegtlin and H. W. Chalkley.—p. 3041.
Black Tongue: Preventive Value of Minot's Liver Extract. J. Goldberger and W. H. Sebrell.—p. 3064.

45: 3105-3177 (Dec. 19) 1930

Water Purification: V. Prechlorination in Relation to Efficiency of Water Filtration Processes. H. W. Streeter and C. T. Wright.—p. 3105.
Consecutive Readings of Pulse Rate on Small Group of Clerks. R. H. Britten and C. R. Wallace.—p. 3128.

Rhode Island Medical Journal, Providence

13: 175-188 (Dec.) 1930

Hemorrhagic Disease of the New-Born. H. L. Emidy, Woonsocket.—p. 175.
Spontaneous Pneumothorax in Children: Case. R. C. Bates, Providence.—p. 177.

Surgery, Gynecology and Obstetrics, Chicago

51: 749-878 (Dec.) 1930

Development of Cancer in Burn Scars: Thirty-Four Cases. N. Treves and G. T. Pack, New York.—p. 749.
*Carcinoma of Rectum. E. P. Hayden and W. M. Shedden, Boston.—p. 783.
*Respiratory Complications and Surgical Patient. H. L. Foss and J. H. Kupp, Danville, Pa.—p. 798.
*Blood Supply of Human Parathyroids. G. M. Curtis, Chicago.—p. 805.
*Roentgenology of Appendix. J. W. Larimore, St. Louis.—p. 810.
*Treatment of Postoperative Tetany: Administration of Irradiated Ergosterol. L. Jacques, Chicago.—p. 823.
Operations on Solitary Kidneys and Ureters: Fifty-Two Cases. W. Walters and W. Wright, Rochester, Minn.—p. 836.
Periduodenitis. J. Shoemaker, The Hague, Holland.—p. 840.
Obstructive Jaundice. R. P. Rowlands, London.—p. 844.
Cyclical Changes in Vaginal Mucous Membrane. S. H. Geist, New York.—p. 848.
*Diagnosis of Contracted Pelvis by Impression Method. D. S. Hillis, Chicago.—p. 852.
Plaster Embedded Skeletal Traction in Treatment of Fractures. K. Speed, Chicago.—p. 854.
*Adeno-Acanthoma of Uterus with Metastasis to Posterior Mediastinum and Lungs. A. Stein and F. Torek, New York.—p. 856.
Meckel's Diverticulum. R. M. Harbin, Rome, Ga.—p. 863.

Carcinoma of Rectum.—In the 303 cases analyzed by Hayden and Shedden, adenomatous polyps constituted the most dangerous precancerous lesion. The fifth decade of life showed the greatest incidence of cases. A family history of cancer was obtained in only 7 per cent of the cases. Malignant adenoma and adenocarcinoma grade 1, the two lowest grades of malignancy, formed 77 per cent of the 101 cases available for grading. Biopsy for diagnosis, prior to instituting therapy, is considered always advisable and never harmful. Change in bowel habits, bleeding, and rectal pain should always suggest the possibility of cancer even though hemorrhoids also are visible. Digital rectal examination is sufficient to make a diagnosis in 95 per cent of the cases. Every cancer of the rectum is operable if discovered early enough, and the period during which it remains operable is longer than in most other cancers. Obstruction necessitating emergency colostomy is rare in rectal cancer. Colostomy, as an adjunct to radical operation, is always necessary. In the entire series only twenty-one patients who had positive pathologic reports of cancer are alive without symptoms, and all have had complete operations. A radical resection, by one of several methods, and including colostomy, offers the patient his best and virtually his only chance of cure. Radical operation definitely prolonged the life of the forty-two who subsequently died of recurrence. Radium and the roentgen rays, as at present used, must be considered purely as palliative agents in the treatment of cancer of the rectum. Patients receiving no treatment lived about the same length of time, on the average, as did those irradiated. Changes in technic of application may, in the future, improve this situation. Surgical diathermy is of use in reducing the bulk of an inoperable growth.

Respiratory Postoperative Complications.—Foss and Kupp believe that their study strengthens the theory that embolism plays the chief part in the production of most postoperative pulmonary complications. Infarctions (minor emboli) are far more common than has been generally supposed. Aspiration is a minor factor in the production of pulmonary complications. Pulmonary complications are infinitely less common following operations on the upper respiratory tract than following operations on the abdomen and pelvis. Irritation by the anesthetic or the aspiration of foreign substances during inhalation anesthesia probably plays a part in the production of postoperative bronchitis and pneumonia. However, the fact that these complications with great frequency follow spinal and even local infiltration anesthesia suggests that other factors play an equally important part. Pulmonary complications have their highest incidence in the winter months (December, January and February) and are far more common in patients of advanced years. In the light of present knowledge, treatment of these conditions should consist of (1) hyperventilation during and after operation with carbon dioxide and oxygen, as advocated by Scott and Cutler; (2) change in the position of the patient every six hours, after operation (Santé); (3) curtailment of sedatives after operation, especially those which depress the cough reflex, and, when collapse occurs, the bronchoscopic removal of the mucus or, whenever the other complications considered are present, the use of the newest and most valuable aid, the oxygen tent.

Blood Supply of Human Parathyroids.—The blood supply to the human parathyroids, particularly the collateral blood supply, was studied by Curtis in twenty-five cadavers immediately preceding necropsy. Abundant anastomoses were demonstrated between the thyroid arteries, especially the inferior, and the arteries of the larynx, pharynx, trachea, esophagus, and the surrounding fascia. The thyroid arteries also anastomose with one another and across the median line, particularly in the region of the isthmus. The parathyroids receive their single artery, as a rule, from the inferior arteries. The collateral blood supply to the parathyroids is ample. The demonstration of injection mixture in the parathyroid glands following the preliminary ligature of both inferior thyroid arteries, and even of all four thyroid arteries, substantiates this conclusion and places it on a firm experimental basis.

Roentgenology of Appendix.—Larimore states that only roentgenology will develop the intrinsic and direct signs of appendical pathologic change. Roentgenograms will in a large percentage of instances show the appendical lumen. Often this will indicate definite anatomic changes. Chiefly with, but also without, visualization there may be adduced from the films and by fluoroscopic palpation associated evidence, which will have additional significance. Such objective evidence of anatomic change is not alone proof of an active relation to any clinical syndrome. It must find definite correlation to the clinical conditions. The roentgenologic facts about the appendix are objective and valid facts which cannot rightly be ignored in diagnostic attention to the appendix. Their consideration in connection with other conditions found in alimentary and abdominal syndromes will increase the accuracy of diagnosis and can bring about improvement in the adverse statistical results of surgery of the appendix.

Treatment of Postoperative Tetany by Viosterol.—Six cases of human postoperative tetany treated with viosterol are reported by Jacques. In the two more severe cases of the series, no improvement resulted from the use of this agent. In three of the four remaining cases, variable degrees of improvement, in which the rôle of viosterol could not entirely be excluded, appeared to ensue. It is felt that these observations do not sustain the view that the action of vitamin D occurs through the agency of the parathyroid bodies.

Diagnosis of Contracted Pelvis by Impression Method.—A modification of the Mueller maneuver is proposed by Hillis. With the patient in the lithotomy position on a table, not too high, the examining finger in the rectum locates the tips of the ischial spines and notes the relation of the lowest part of the baby's skull to a line drawn between them. The hand on the outside is placed above the breech of the baby and is sunk as deeply as possibly toward the mother's spine, the forearm parallel to the long axis of the mother. Pressure is then made on the breech toward the inlet and the descent of the head noted with reference to the interspinal line, allowance being made for the thickness of the lower uterine segment, the cervix or caput succedaneum if present. To avoid traumatism and pain, the pressure is begun gradually and after the maximum is reached is slowly released. If the head cannot be impressed to the spines, an assistant places the palm of one hand flat over the middle of the baby's back to prevent flexion and the fingers of the

other hand placed palmar surface downward above the head over the symphysis presses the head downward and backward in the axis of the inlet while the examiner makes pressure on the breech and notes descent with the internal finger. If impression fails with the aid of an assistant, a trial is made under a short surgical degree of anesthesia. With the use of the method in several thousand cases there have never been observed bad effects of any kind whatever to mother or babe.

Adeno-Acanthoma of Uterus with Metastasis to Lungs.—A fairly thorough review of the literature made by Stein and Torek failed to reveal any instance of this complication with the type of neoplasm under consideration. The patient was a married woman, aged 42, whose symptoms and signs suggested carcinoma of the uterus. When hysterectomy was performed in 1927, the entire uterine wall was found to be invaded by carcinomatous tissue. Microscopically, the growth was composed of glandular and squamous elements. Up until two and one-half years after operation there was no evidence of local recurrence. A little more than two years after the hysterectomy, the patient complained of gastric pain, loss of appetite, and difficulty in swallowing. There was rapid loss of weight. Physical signs in the chest suggested fluoroscopic examination, which revealed a smooth, round, sharply circumscribed mass in the mediastinum. It was thought to be a cyst but, when removed, proved to be an adeno-acanthoma of the lung and posterior mediastinum, secondary to the earlier growth in the uterus. The patient made a good recovery from the operation.

United States Vet. Bur. M. Bull., Washington, D. C.

6: 1037-1124 (Dec.) 1930

*Carbon Dioxide-Oxygen Inhalations in Catatonic Dementia Praecox. P. G. Lasché and H. Rubin.—p. 1037.
*Phrenicotomy: Thirteen Cases. J. D. Brooks.—p. 1042.
Use of Lipiodol. R. C. Shawhan.—p. 1049.
*Emotions in Psychotic Patients. H. L. Flowers.—p. 1055.
Diagnosis of Peptic Ulcer. W. S. Anderson.—p. 1059.
Clinical Record of Patient. W. E. Park.—p. 1067.
Hemorrhage Following Tonsillectomy. W. W. Hendricks.—p. 1070.
Surgical Extraction of Teeth. H. A. Single.—p. 1073.
False Ball and Socket Joint. B. F. Ward.—p. 1075.
Gastrojejunocolic Fistula, with a Barium Enema Entering the Esophagus. C. C. Lyons.—p. 1075.
Adenocarcinoma of Kidney. H. Caldwell.—p. 1078.
Value of Occupational Therapy in Tuberculosis Hospital. F. L. Locke.—p. 1080.
Postgraduate Course in Neuropsychiatric Nursing. G. H. Andrew.—p. 1082.
Importance of Diet in Skin Diseases. F. M. Seibert.—p. 1086.
Motivation of Reading Among Neuropsychiatric Patients. M. B. Graham.—p. 1088.

Carbon Dioxide-Oxygen Inhalations in Catatonic Dementia Praecox.—Nine patients, suffering from catatonic dementia praecox, were given carbon dioxide and oxygen inhalations by Lasché and Rubin. Five showed definite evidence of cerebral stimulation; two showed mental lucidity. In four, mutism continued throughout the trials. The physical reactions as previously noted by other observers were confirmed. Ammonium chloride, daily, produced a questionable lessening of muscular rigidity.

Indications for Phrenicotomy.—From his experience with thirteen cases, Brooks concluded that a radical phrenicotomy can be performed in far advanced cases of pulmonary tuberculosis with safety and with a reasonable hope of benefit to the general condition of the patient, at least temporarily, and a stronger probability of relieving distressing symptoms. It should be used to supplement treatment by artificial pneumothorax, especially when adhesions prevent collapse of a tuberculous cavity. It is especially indicated in lesions of the lower lobe of a lung but also assists in upper lobe compression.

Emotions in Psychotic Patients.—Flowers endorses the Pressey test as being a valuable aid in understanding individual patients and showing definite correlation with the clinical observations of psychotic patients. Psychotic patients react more strongly to fear words, self-interest words and hypochondriacal words than do normal people, and less to disgust words, sex-interest words, and neurotic-interest words. In general, the more normal a psychotic patient is, the nearer his reactions to the Pressey test will approach the normal reactions; and the more psychotic a patient, the further will his reactions to the Pressey test vary from the normal.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

5: 371-443 (Dec.) 1930

Intraperitoneal Therapy in Diseases of Children. C. G. Grulee and H. N. Sanford.—p. 371.
*Abdominal Symptoms in Acute Rheumatism. J. J. J. Giraldi.—p. 379.
*Blood Constituents in Acute Rheumatism Before and After Salicylate Treatment. E. M. Hickmans and S. H. Edgar.—p. 387.
Nirvanol Treatment of Chorea. O. R. Tisdall.—p. 397.
Treatment of Swift's Disease (Erythroderma). G. B. Sweet.—p. 405.
*Relationship of Throat Infection to Acute Rheumatism in Childhood. B. Schlesinger.—p. 411.
Value of Different Therapeutic Agents in Treatment of Rickets. O. Macrae.—p. 431.
*Immunology of Scarlet Fever. W. R. F. Collis and A. G. Watkins.—p. 441.

Abdominal Symptoms in Acute Rheumatism.—Giraldi feels that digestive symptoms precede the onset of acute rheumatism more often than is at present realized. So far there is no warrant for the use of the term rheumatism appendicitis, but in some cases acute rheumatism appears to give rise to symptoms simulating an acute appendicular inflammation. Acute peritonitis at the onset of an attack of acute rheumatism is a rare phenomenon; but there is not infrequently, in acute cases, evidence of invasion of the peritoneum by the rheumatic virus. These abdominal manifestations of acute rheumatism are of importance chiefly by reason of the help they may afford to a study of the pathogenesis of the infection.

Blood Constituents in Acute Rheumatism Before and After Salicylate Treatment.—Three cases cited by Hickmans and Edgar of acute rheumatism before salicylate treatment was commenced showed blood urea, nonprotein nitrogen and uric acid somewhat higher than the figures obtained for normal children of the same age. Although salicylate increases the output of total nitrogen, urea and uric acid through the kidneys, and the blood uric acid is thereby decreased, the examination of a large number of cases of rheumatism during treatment indicates that the blood urea and nonprotein nitrogen still remain slightly higher than normal during treatment; and since the blood phosphorus is also slightly higher than normal, it would seem that the kidney in rheumatism is unable to deal adequately with these two products. That this inability is due to some impairment of renal efficiency as a result of the acute rheumatic infection rather than to the salicylate is suggested by the fact that the blood urea of normal children was not found to be increased by similar quantities of salicylate. On the other hand, since blood urea reaches a higher level after salicylate treatment than before salicylate is given, it is possible that salicylate may increase to some extent the degree of renal inefficiency.

Relation of Throat Infection to Acute Rheumatism in Childhood.—Schlesinger emphasizes the important part played by the tonsils in connection with acute rheumatism in childhood. There can be little doubt that rheumatic relapses are largely brought about by acute and often extremely mild throat infections. Study of the bacteriology of the tonsillitis does not reveal any one specific type of streptococcus to be responsible either for the throat infection or for the acute rheumatism that follows. The time interval of from ten to twenty-one days between the onset of tonsillitis and the rheumatism, and the whole problem is best explained on an allergic basis, comparable to serum disease. This by no means excludes a bacterial origin for rheumatic disease, since here a bacterial antigen is an essential precursor of the allergic state. Far from supplanting the streptococcus, an allergic theory helps to strengthen the view that this group of micro-organisms is the exciting cause of the disease. Prophylaxis is naturally the ultimate aim, and tonsillectomy would seem to be the most obvious course. The problem is centered on the pharynx; it seems that, if outbreaks of throat infection could be avoided, rheumatic relapses would practically never occur. Acetylsalicylic acid given for some weeks after the onset of tonsillitis has proved to be a valuable method of preventing the recurrence of serious rheumatism.

Immunology of Scarlet Fever.—A case cited by Collis and Watkins affords additional evidence in support of the view that scarlet fever is not a simple toxin-antitoxin phenomenon

and that the Dick test should be regarded merely as an indication of the presence of antitoxin in the patient's serum and not as a guide to the general immunity of the patient to the specific streptococcus of the disease.

British Medical Journal, London

2: 1031-1072 (Dec. 20) 1930

*Menstruation and Irregular Uterine Hemorrhage of Ovarian Origin. J. Young.—p. 1031.
*Congenital Dislocation of Hip: Treatment by Manipulation. E. L. Evans. —p. 1035.
Pleural Effusions in General Practice. W. A. Dickson.—p. 1036.
Treatment of Lymph Glands in Carcinoma of Cervix Uteri. M. Donaldson.—p. 1039.
Appendix Concretions Opaque to Roentgen Ray. C. A. Wells.—p. 1041.
Case of Human Intestinal Myiasis. J. F. D. Shrewsbury.—p. 1043.
Fat Necrosis of Breast. H. A. Cookson.—p. 1043.

Menstruation and Irregular Uterine Hemorrhage of Ovarian Origin.—Young states that menstruation can occur in the absence of ovulation and the corpus luteum, and it cannot therefore be interpreted in terms of an analogy with pseudopregnancy in lower animals, for which a luteal phase is necessary. Further, its place in the cycle in relation to ovulation undermines the conjectural analogy between it and proestrous bleeding in lower animals. These analogies can be further invalidated and the essential meaning of its existence in man and monkeys explained by recognizing it as a function of the peculiarly hemorrhagic type of implantation of the ovum found in these higher forms. The bleeding of menstruation and the bleeding of implantation are homologous in that they occupy the same place in the sex cycle, and the external bleeding expresses the escape of the unwanted "implantation blood" in an infertile or a nonovulating cycle. Many of the bleeding disorders erroneously attributed to such conditions as chronic glandular endometritis, chronic metritis, and fibrosis uteri, are in reality expressions of disturbances of unknown origin in the ovarian (or combined pituitary-ovarian?) regulation; and definite clinical entities with correlated structural changes in the ovary can be recognized.

Congenital Dislocation of Hip—Treatment by Manipulation.—Evans urges that manipulative reduction at the earliest age should be employed. In children under 2 or 2½ the reduction can usually be obtained with the greatest ease while the adductors are being gently stretched. In older children, if an early reduction is not obtained, two further attempts at intervals of seven to ten days should be made, when reduction without force will usually be possible. After three unsuccessful attempts, capsulotomy is indicated in order to deal with the obstruction of soft parts. If, after successful reduction, redislocation occurs from failure of growth of the superior and posterior borders of the acetabulum, the border should be levered over the head and held by a bone graft. The age limit for manipulative reduction is 7 to 8 in unilateral and 5 to 6 in bilateral, cases. In cases beyond these age limits, open reduction is indicated.

Lancet, London

2: 1331-1382 (Dec. 20) 1930

*Neuromuscular Obstructions of Gastro-Intestinal Tract. A. J. Walton. —p. 1331.
*Toxicology of Thallium. G. R. Lynch and J. M. S. Scovell.—p. 1340.
Experimental Induction of Tumors with Blast Furnace Tar. I. Berenblum.—p. 1344.
Hematemesis as Symptom of Gastric or Duodenal Ulcer. B. Hughes. —p. 1346.
Severe Lead Poisoning from Drinking Water: Case. N. Lorraine.—p. 1347.
Abdominal Torsion of Omentum. D. Robb.—p. 1347.

Neuromuscular Obstruction of Gastro-Intestinal Tract.—Three changes that may give rise to obstruction in some portion of the intestinal tract are discussed by Walton. These three are: (1) paralysis of both systems, or, as Koehler suggests, a balance at a lower level than normal; (2) relative paralysis of the vagus, or overaction of the sympathetic, for all impulses; (3) relative paralysis of the vagus, for those impulses which pass only to the sphincters. He states that not only are these conditions of interest in that for many years they have led to much discussion as to their cause, but they direct attention to one of the most important problems of modern medicine. They all show a congenital and often an hereditary fault. In some the actual disease dates from birth, in others it is only the tendency that appears to be congenital They also appear to be getting more frequent, so that together they now form a large proportion of all abdominal cases. With the control and consequent diminution of acquired disease there is no decrease; indeed, there appears to be an increase in the congenital faults of the race.

Toxicology of Thallium.—Lynch and Scovell are of the opinion that thallium acetate should not be used as an ordinary routine treatment for ringworm of the scalp, because: 1. Thallium in itself is a highly toxic substance showing a marked similarity to lead, both in its chemistry and in its toxic symptoms, and the far-reaching effects of the poison are much greater than is generally supposed. 2. It has a definitely selective action on all forms of nervous tissue, and even in infinitesimal doses it causes slight degenerative changes in the brain cells of rats. It is therefore most unlikely to leave the human brain entirely unchanged, and it seems impossible to be certain that it does not hinder further brain development. 3. The margin between an epilating and a toxic dose is extremely small and allows for no idiosyncrasies, whereas with roentgen rays the dosage is very accurate, trouble is rare, and if a mishap occurs it is at least local. 4. Ringworm of the scalp is not in itself a fatal disease and, though often troublesome, can usually be cured by other means. It therefore does not seem justifiable to use such a powerful poison in an attempt to cure it a little more quickly. 5. It is quite easy to obtain thallium salts in a state of purity, and there is no especial reason why a solution which has been kept for some time should not be used. The authors do not believe that toxic phenomena were ever due to the use of an old solution.

Bulletins et Mém. de la Soc. Nat. de Chirurgie, Paris

58: 1183-1237 (Nov. 15) 1930

Elephantiasis of Lower Limb. F. M. Cadenat.—p. 1184.
Cleft Palate: Treatment. Barbaro.—p. 1186.
Coxofemoral Tuberculosis of Hip Formerly Treated for Osteochondritis. G. Rottenstein.—p. 1195.
Osteoid Chondrosarcoma of Humerus with Eburnative Osteitis. G. Moutier.—p. 1205.
*Aneurysmal Tumor of Uterine Artery After Subtotal Hysterectomy. A. Morice.—p. 1211.
Lumbosacral Spina Bifida. Brugeas.—p. 1214.

Aneurysmal Tumor of Uterine Artery After Subtotal Hysterectomy.—Morice reports a case of an aneurysmal tumor in a woman. The patient began to feel vague, dull pains in the hypogastric region. Three months later the pains suddenly became intense and piercing; they were accompanied by severe nausea without vomiting and by marked constipation. The only significant fact revealed by the anamnesis was a subtotal hysterectomy for salpingitis five years previously. Digital examination of the vagina showed the cervix of the uterus to be neither softened nor dilated though its mobilization was painful. In the right culdesac was a globular mass the size of a large nut over which the vaginal mucosa moved easily but which was extremely painful on pressure. The pains became so intolerable that immediate intervention seemed expedient. An aneurysmal tumor, almost ready to rupture, was found at the termination of the uterine artery. The veins also were involved in the growth. However, the fact that the ureter extended through the entire tumor made it impossible to remove it except by fragmentation. It could not be determined, therefore, whether it was a simple arterial aneurysm or an arteriovenous aneurysm. The chief point of interest is the fact that the tumor developed at the point where a ligature had been made after the hysterectomy. The growth was undoubtedly caused by a wound of the uterine artery by the point of the needle used in making the ligature.

Gynécologie et Obstétrique, Paris

22: 289-384 (Oct.) 1930

*Surgical Treatment for Low Insertion of Placenta. Turenne.—p. 289.
*Method of Surgical Treatment for Sclerocystic Ovaritis. C. A. Castaño and A. S. Introzzi.—p. 301.
Dilation of Cervix of Uterus at End of Pregnancy Under Spinal Anesthesia. A. Ginglinger and R. Pinsan.—p. 313.
Treatment of Incoercible Vomiting by Insulin. J. Akimoff, R. Kroupenin and N. Albegoe.—p. 328.
Osteoplasia of Ovary. E. Hitzanides and Photakis.—p. 334.

Surgical Treatment for Low Insertion of Placenta.—From the personal observation of seventy-four cases of placenta

praevia, Turenne draws the following conclusions: 1. In general, in every case of pregnancy in which the diagnosis of low position of the placenta is made the patient should be taken to the hospital so that she may receive without delay whatever treatment is needed. 2. The classic obstetric treatment should be reserved for cases of placenta praevia at a distance from the internal orifice of the cervix, and in particular for cases in which the advanced evolution of labor makes possible a termination without traumatism of the cervix, placenta or fetus. 3. High intervention should be practiced when the placenta is accessible in the lumen of the cervix, even if not dilated and without actual profuse hemorrhages; when the cervix is fully dilated and the placenta is in the area of the internal orifice with profuse or persistent hemorrhage, and when there are repeated or persistent small hemorrhages and clinical exploration shows total or partial thickening of the inferior segment with malaccommodation of the fetus. 4. When surgical intervention is decided on, one should abstain from vaginal intervention of any kind. 5. For pure cases, the classic high cesarean section should be used; in the others one should use segmentary cesarean section with preliminary exteriorization of the uterus and careful protection of the peritoneum; in a case of severe infection a subtotal hysterectomy should be made without preliminary opening of the uterus.

Method of Surgical Treatment for Sclerocystic Ovaritis.—Castaño and Introzzi believe that the most important factors in the etiology of sclerocystic ovaritis are congestion and alterations of the sympathetic pelvic neurons. They recommend the following method of surgical treatment, which they have used in a number of cases with excellent results. A low Pfannenstiel laparotomy is made, followed by careful exploration of the internal genitalia, in order to confirm the diagnosis. Placing the ileo-ovarian ligament under tension, they make with a bistoury a buttonhole incision from 3 to 4 cm. long at its free edge. With a blunt instrument they free the serous membrane along its entire length together with the contents of the ligament. With the same instrument or with a dull needle they then rid all the elements contained in the ligament of fatty cellular tissue and resect from 1.5 to 2 cm. of the ligament. The ends are united. They tear up the fatty cellular magma with the same instrument. They then bring the edges of the wound together again by joining the catgut sutures at each end and close the opening in the peritoneum. Both ileo-ovarian ligaments are treated in this way. An appendectomy is performed as a prophylactic measure.

Paris Médical

2: 429-456 (Nov. 15) 1930

Social Insurance and "Maladies Professionnelles." V. Balthazard.—p. 429.
Workings of Social Insurance System. P. Cibrie.—p. 430.
New Jurisprudence on Professional Secrecy: Arrest of Court of Appeal of Orléans. M. Duvoir and H. Desoille.—p. 433.
Crusade Against Infant Mortality. P. Lereboullet.—p. 436.
Acute Meningitis in Fractures of Cranium. Dervieux and Szumlanski.—p. 444.
*Hemorrhages and Thromboses of Acute Asphyxias. H. Desoille.—p. 447.
*Case of Epilepsy from Compression of Frontal Lobe Revealed by Necropsy. Balthazard and Szumlanski.—p. 451.
Intratracheal Injections of Iodized Poppy Seed Oil in Diagnosis of Pulmonary Sequelae in Persons Gassed in War. Y. Hélie.—p. 453.

Hemorrhages and Thromboses of Acute Asphyxias.—Desoille shows that every acute asphyxia, and in general every rapid and severe death struggle, produces hemorrhagic symptoms, usually with purpura. The fact that after asphyxias caused by carbon monoxide, in addition to purpura, gangrene of the limbs caused by arterial thromboses is often observed has led to a common though mistaken assumption that the symptoms are due to special toxic qualities of the gas that affect the nervous system. It has been proved, however, that the arterial thromboses that produce gangrene are observed in any form of asphyxia in which the patient survives for any length of time. They are most frequently observed in asphyxias from carbon monoxide merely because it is only in rare cases that a patient survives after asphyxia from any other cause. This fact is important from the standpoint of prognosis, since even when the immediate effects of an asphyxia seem to have disappeared the possibility of later symptoms equally fatal must be considered. Although the exact pathogenesis of the hemorrhagic symptoms is not fully determined, it is clear that important rôles are played by hypertension of the blood, retarded circulation, an excitation of the sympathetic nervous system and, to some extent, local pulmonary traumatism and irregular respiration. While the purpura and gangrenes both in cases of rapid asphyxia and in other cases of acute agony are merely the results of the primary condition and are in no way fatal in themselves, they may be regarded as definite symptoms of sudden death.

Case of Epilepsy from Compression of Frontal Lobe.—Balthazard and Szumlanski report a case of epilepsy of nontraumatic origin in which necropsy revealed an intracranial tumor that caused compression of the frontal lobe. The compression was evidently responsible for the existence of the epileptic attacks, which first appeared at the age of 17. The frequency of the attacks and the development of certain concomitant mental troubles was also due, at least in part, to the fact that the patient was a confirmed alcoholic addict. After having been in various hospitals five times for treatment, he did not have a single attack throughout his last seven months sojourn in the sanatorium. He was released, began to drink excessively again, and three days later died of a hemorrhage in the course of an epileptic attack.

Presse Médicale, Paris

38: 1513-1528 (Nov. 8) 1930

*Therapeutic Pneumothorax Without Hospital Residence. G. Poix and A. Bosnières.—p. 1513.

Therapeutic Pneumothorax Without Hospital Residence.—Poix and Bosnières describe a method of treatment of tuberculosis by therapeutic pneumothorax that does not necessitate hospital residence and that therefore seems destined to favor a more widespread use of the operation. The preliminary examination of the patient usually requires about eight days, during which time the patient comes several times to the hospital or clinic for various tests. A visiting nurse also inspects the patient's home in order to make sure that the social and hygienic conditions will enable him to have the complete rest, careful diet and fresh air that are necessary for the success of the treatment. If the indications are still favorable, the patient is then brought to the hospital for the operation, usually early in the morning, after a light breakfast, since a long wait often causes fatigue and worry, which tend to produce pleural eclampsia. He is taken to a room containing a bed and a Kuss apparatus with the necessary equipment. He lies on the bed, on the side opposite the pulmonary lesions, his head on a thin pillow, his arm above his head, and his thorax elevated by a rigid cushion. Anesthesia of the skin at the point of puncture is produced by ethyl chloride. For disinfection of the skin, after preliminary washing with alcohol and ether, a 30 per cent solution of iodine in chloroform is used. The puncture is then done, preferably at the level of the axillary line, at a point where the stethacoustic and the roentgen examination show that there are no underlying lesions. After the insufflation, for which a trocar and cannula are used and which consists of 100 cc. of oxygen followed by from 100 to 150 cc. of filtered air, the patient rests for a few moments, then passes before the roentgenoscopic screen and is permitted to go home. A trocar and cannula are used for the second insufflation also, which is given two days after the first and consists of not more than 300 cc. of air. Beginning with the third insufflation a Kuss needle is used. The reinsufflations are given every week for a few months, and then every fifteen days. The patient should remain in bed for at least six months and during that time should keep a careful record of his temperature and weight and of the character of his expectorations. If the instructions are carefully followed, this method of treatment can be used with entire success in cases in which the lesions are not too advanced and which do not present any serious complications. The authors made a comparative study of the results of 47 cases in which the patients were not required to remain in the hospital and of 124 hospital cases. They were unable to observe any superiority in the results obtained by hospitalization. However, they wish to emphasize the extreme importance of having the patient give as careful attention to rest and diet at home as though he were in the hospital, especially during the first six months.

Archivio Italiano di Chirurgia, Bologna

27: 301-412 (Oct.) 1930

*Remote Results of Cholecystectomy. G. Giuliani and L. Feci.—p. 301.
Diverticula of Duodenum. A. Pignatti.—p. 333.
Treatment of Trigeminal Neuralgia. G. Pieri.—p. 357.
Epidermoids. G. Lucchese.—p. 386.

Remote Results of Cholecystectomy.—Giuliani and Feci, in conclusion, state that the morphologic changes in the duodenal region (which is most directly affected by the operative act), cannot be considered *a priori* as responsible for the disturbances that sometimes arise in patients following cholecystectomy. There is no direct relation between the various degrees of such periduodenal changes and the subjective and objective conditions under which the gastric digestion proceeds (at least, as far as is apparent roentgenologically). Aside from the cases in which a stenosis due to adhesions is brought about, frequently the clinical and the roentgen examinations, extended to the rest of the abdomen, will reveal the existence of lesions located in other portions of the alimentary tract (appendicitis, colitis) which deserve to be considered responsible for the reflex disturbances complained of.

Policlinico, Rome

37: 509-556 (Nov. 1) 1930. Medical Section

*Chemical Changes in Salivary Secretion in Epidemic Parotitis. F. Rocchi.—p. 509.
Chemotherapy of Rabies. L. Barchi.—p. 533.
Quantitative Variations of Lipoids and of Their Relations in Blood in Experimental and Clinical Anemias. S. Marino.—p. 541.

Chemical Changes in Salivary Secretion in Epidemic Parotitis.—Rocchi states that his study of the chemical behavior of the salivary secretion of the parotid glands in epidemic parotitis, carried out in numerous cases for the whole course of the disease and also for the convalescent state, shows important changes in the elimination of calcium and chlorine. The calcium and the chlorine contents of the secretion are increased on the fourteenth and the fifteenth day and then diminish slowly, returning to normal value about the seventeenth to the twentieth day from the onset of the disease.

Rivista di Clinica Medica, Florence

31: 881-935 (Aug. 31) 1930

*Gastric Chemism in Diagnosis of Surgical Disorders of Stomach. T. Greco.—p. 881.
*Tuberculosis in Its Relations to Gastro-Intestinal Disorders. P. Catelani.—p. 916.

Gastric Chemism in Diagnosis of Surgical Disorders of Stomach.—Greco affirms the value of the examination of the gastric chemism, reviews briefly the various methods of research and dwells on the histamine test. By means of this test, acidity curves characteristic of gastroduodenal ulcers and especially cicatricial pyloric stenosis can be secured. The neoplastic types behave diversely, depending on the site and the extent of the tumor. A complete achlorhydria points to an extensive destruction of the gastric mucosa. Histamine represents, according to the author, a stimulus normally present in the physiologic process of the gastric secretion. Furthermore, the dosage can be easily and exactly measured. Hence the histamine test offers the only stimulus that will serve all research workers in determining the physiopathology of the gastric secretion. The author gives in detail observations in normal subjects and in exploratory laparotomy, gastroduodenal ulcer, pyloric stenosis and gastric cancer.

Tuberculosis in Its Relations to Gastro-Intestinal Disorders.—Catelani holds that tuberculosis alone can rarely be considered the determining cause of gastroduodenal ulcer. If one assigns such an influence to tuberculosis in the causation of gastroduodenal ulcer, one must, with greater reason, recognize the importance of tuberculosis in the development of certain gastro-intestinal dysfunctioning. A disturbed vagosympathetic equilibrium may be the cause determining gastro-intestinal disturbance in a tuberculous patient. The author thinks that no relation need exist between the discussed gastro-intestinal disorders and tuberculosis in general but that the relation must be confined not only to pulmonary tuberculosis but even to particular types of pulmonary tuberculosis.

Rivista di Patologia e Clin. della Tubercolosi, Bologna

4: 829-920 (Oct. 31) 1930

Experimental Researches on Histogenesis of Tuberculous Meningitis. A. Costa.—p. 829.
Pleuritis Resulting from Pneumothorax. A. Longo.—p. 842.
*Application of Alcohol to Intercostal Nerves in Treatment of Pulmonary Tuberculosis. M. Belli.—p. 850.
Pneumothorax or Phrenico-Exeresis? D. Michetti.—p. 879.
*Jacobaeus Operation. C. Zoboli.—p. 886.
*Prolonged Calcium Therapy in Advanced Stages of Pulmonary Tuberculosis. T. Crippa.—p. 901.

Application of Alcohol to Intercostal Nerves in Treatment of Pulmonary Tuberculosis.—Belli, on the basis of pneumographic researches carried out before and after alcoholization of the intercostal nerves, takes up the disputed question of the rôle played by the intercostal muscles in the mechanism of respiration and shows that they participate actively in the causation of the respiratory movements and that those movements have the widest range at the points where the intercostal muscles have the most ample play. As to the practical application of the alcoholization of the intercostal nerves in the treatment of pulmonary tuberculosis, the author describes six cases of that disease treated by this method and followed up with repeated clinical and roentgen examinations. The results were not entirely satisfactory but the author thinks the method has a certain supplementary value (never as a substitute for collapsotherapeutic methods), especially in cases of incoercible hemoptysis in which the condition of the patient does not permit more radical mechanical interventions.

Jacobaeus Operation.—Zoboli gives a number of clinical observations and confirms the opinions advanced in regard to the value of the Jacobaeus operation, if applied early, in the presence of pleural adhesions in therapeutic pneumothorax and points out the great difficulty that is at present encountered in the accurate diagnosis of such adhesions, as regards their site, number, form and nature. He refers also to certain cases in which the excellent results from the operation show their beneficent effects after the lapse of three years since the intervention, the patients having been able to resume their normal occupations.

Prolonged Calcium Therapy in Advanced Stages of Pulmonary Tuberculosis.—To persons with advanced pulmonary tuberculosis, Crippa gave up to eighty intravenous injections of 10 cc. each of a solution of calcium gluconate, at the rate of three a week. The results secured were excellent and lasting.

Semana Médica, Buenos Aires

37: 1249-1328 (Oct. 23) 1930

Subacute Inguinal Poradenitis: Surgical Treatment. F. R. Ruiz and W. Tejerina Fotheringham.—p. 1249.
Syphilitic Amyotrophy: Two Cases. J. C. Montanaro, J. L. Hanón and E. F. Bonnet.—p. 1272.
Localization of Hepaticola Cancerogena in Epithelium of Pharynx of Rat. M. Beatti.—p. 1278.
*Arterial Embolism from Intramuscular Injections of Bismuth in Treatment of Syphilis. L. A. Cordiviola and A. J. Guiroy.—p. 1279.
Prolapse of Superior Bulb of Jugular Vein into Middle Ear. R. Podestá.—p. 1281.
Chlorosis and Chlorosis Anemia in Infants: Seven Cases. J. Damianovich.—p. 1286.
Atypical Primary Actinomycosis of Skin: Case. M. Fernández Blanco.—p. 1294.
Pyelography: Intravenous Injections of Iopax. E. Lorenzo, B. Varela Fuentes and P. Rubino.—p. 1315.

Embolism from Intramuscular Injections of Bismuth in Treatment of Syphilis.—Cordiviola and Guiroy call attention to the possibility of an arterial embolism after an intramuscular injection of bismuth (either soluble or insoluble salts of bismuth) in the treatment of syphilis. In order to avoid such a danger the authors advise subaponeurotic injections. After the needle has been introduced, the entrance of blood should be expected, and a movement of slight aspiration should be made with the syringe before injecting its content, in the event that the needle is obstructed, thus preventing the flow of blood. The injections should be made at the internal part of the buttocks where the blood vessels are fewer than in some other parts of the buttocks. If arterial embolism is produced, it should be treated as soon as it is diagnosed. The symptoms produced by arterial embolism are spectacular. The authors

report a case in a syphilitic patient, aged 20, who immediately after the eighth intramuscular injection of bismuth had a painful reaction followed by the development of a hard local inflammation, pain that radiated to the entire leg, and the appearance of arborizations of dark red hue in the area in which the injection had been made, some of which arborizations ended in the formation of superficial scars. All symptoms proved to be caused by the presence of an arterial embolism. The authors explain the mechanism which, in their opinion, is involved in the production of arterial embolism, and they present pictures of the observations made in the microscopic study of serial sections made after a biopsy.

Siglo Médico, Madrid

86: 481-508 (Nov. 8) 1930

*Should Proteinotherapy Be Used in Treatment of Acute Anterior Poliomyelitis? M. Algora Nieto.—p. 481.
Gout: Pathogenesis: Treatment with Mineral Waters. C. García de Cosa.—p. 487.

Should Proteinotherapy Be Used in Treatment of Acute Anterior Poliomyelitis?—Algora Nieto presents the indications and contraindications for proteinotherapy in acute anterior poliomyelitis. He believes that several nonalbuminoid organic and inorganic substances, as well as venesection or a fixation abscess, have an action similar to that of proteinotherapy. By both means the reabsorption of the albumins disintegrated by the organism and acting on the organism and on the metabolism as foreign albumins is secured. In the treatment of acute anterior poliomyelitis, the author considers the serum of convalescents as specific against the disease. It is the sole treatment by which the minimal mortality, the development of the fewest cases of paralysis and the absence of total paralysis of the poliomyelitic children may be expected. Convalescents' serum should be given at the preparalytic stage, after which it is of no value. Paralysis appears from two to four days after the sudden onset of the disease. As early diagnosis and early treatment are necessary, the author describes the most important symptoms on which to base the early diagnosis. The serum should be given intramuscularly in a dose of 30 cc., given either all at once or in two doses (of 15 cc. each). When vaccine or serum is not available, nonspecific proteinotherapy should be used until the curative treatment by means of the specific vaccine or serum may be begun. Proteinotherapy used as coadjuvant treatment of the specific medication makes more valuable the effect of the medication by reinforcing its action against the disease.

Deutsche medizinische Wochenschrift, Berlin

56: 1941-1986 (Nov. 14) 1930

Care of Diabetic Patients. G. Katsch.—p. 1941.
Significance of Psychology in Medical Practice. A. Herzberg.—p. 1943.
Prophylaxis of Tuberculosis: Advantages of Examination of Sputum over Roentgen Examination. P. Schmidt.—p. 1946.
*Tobacco Abuse and Coronary Sclerosis. K. Plenge.—p. 1947.
Results of Surgical Treatment of Cancer Among the Wealthy and Among the Poorer Classes. W. Schwanke.—p. 1948.
*Fruit Diet in Acute Intestinal Disturbances During Childhood. Fanconi.—p. 1949.
Experiences with Blood Transfusion in Grave Ulcerative Colitis. E. Rachwalsky.—p. 1952.
*Chronic Poisoning with Illuminating Gas as Occupational Disease of Housewives and Domestic Servants. K. Holm.—p. 1953.

Tobacco Abuse and Coronary Sclerosis.—Plenge describes the results of postmortem examinations on two patients who smoked excessively. In both of these patients the sclerosis was confined to the coronary arteries, and the changes were most pronounced in the interventricular branch of the right artery. That these patients did not have the usual form of atherosclerosis is proved by the fact that the vessels that otherwise are mainly involved, namely, the aorta, cerebral and renal arteries, were almost entirely free from changes. The microscopic changes in the diseased coronary arteries were much like those which are found in other cases of atherosclerosis. However, especially noteworthy were the marked changes in the media. Besides scars of connective tissue, which had taken the place of destroyed muscle fibers and of elastic tissues, there also were fresh necroses. The author points out that the anamnesis in these cases indicates a relation of this form of sclerosis to excessive use of tobacco. Nicotine has long been known as a vascular poison. By way of the parasympathetic or the vagus it influences the vasoconstrictors and causes vascular spasms. These functional disturbances gradually cause anatomic changes. People using tobacco in excess often die suddenly, and the author thinks that if careful postmortem examinations could be made in all these cases coronary sclerosis would often be detected as the cause. He recalls two such cases. There is no doubt that nicotine is a strong vascular poison. However, it does not affect every one in the same manner. The susceptibility to nicotine poisoning varies in different persons.

Fruit Diet in Acute Intestinal Disturbances During Childhood.—Fanconi states that acute, subacute and chronic forms of diarrhea in children beyond the nursling age can be influenced by giving an exclusive fruit diet for one or two days. Either the child is given only fruit juices, such as orange juice, or it receives from 200 to 500 Gm. of banana pulp. Grated apples have also been found helpful, but bananas have given the best results. It is also permissible to give fruit juices, bananas and apples combined. The main thing is that in the first days only raw fruits are given. The result of this treatment is extremely favorable. The child's appetite increases and the general condition improves. The stools become formed and less frequent. The salt deficiency of the fruits has the effect that edema is quickly overcome. There is usually a loss of weight, but it does not involve danger. The most difficult part of the treatment is the change to the mixed diet. Milk, cereals and sugars should at first be avoided. Instead, mashed potatoes and purées of other vegetables should be given; also almonds, nuts, almond-milk, buttermilk and later sour milk or yoghurt. At the end of the first week or later a mixed diet may gradually be introduced, with milk and zwieback. Cereals should be given only in small quantities.

Poisoning with Illuminating Gas as Occupational Disease of Housewives.—Holm points out that in housewives and in domestic servants there sometimes develops a chronic poisoning caused by illuminating gas. As an example he reports an instance of a household in which the housewife, maid and a child, aged 2½ years, showed signs of this disturbance. The symptoms were paleness, headaches, dizziness, lack of appetite, nausea, insomnia, nervous irritability and general weakness. This form of gas poisoning is usually due to gas stoves; either the connection with the gas pipe is defective or the burners are at fault. The treatment consists in the removal of the cause; that is, a defective gas stove should be replaced by one that does not permit the leakage of gas.

Klinische Wochenschrift, Berlin

9: 2089-2136 (Nov. 8) 1930

Clinical Significance of Capillaroscopy of Mucous Membrane of Lips. Bettmann.—p. 2089.
New Experiences with Registration of Cardiac Sounds and Murmurs. E. Bass.—p. 2092.
Criticism of Passive Transmission of Hypersusceptibility. E. Urbach and B. Sidaravičius.—p. 2095.
*Potent Liver Extract Suitable for Injections. M. Gänsslen.—p. 2099.
*Treatment of Anemia with Stomach Preparations. F. Bertram.—p. 2103.
*Effect of Inhalation of Small Quantities of Benzine and Benzene on Respiratory Organs and on Entire Organism. M. Schmidtmann.—p. 2106.
Relations Between Anterior Lobe of Hypophysis and Cancer of Uterus. J. Hofbauer.—p. 2108.
*Relations Between Increased Frequency of Embolisms and Intravenous Injections. F. Wahlig.—p. 2110.
*Prognosis of Thrombo-Angiitis Obliterans. H. Schlesinger.—p. 2112.
Action of Extract of Suprarenal on Uterus. E. Engelhart.—p. 2114.

Potent Liver Extract Suitable for Injections.—Because many patients have an aversion to the oral administration of liver or of liver extracts, and also because gastro-intestinal disorders frequently are a hindrance to proper resorption, Gänsslen attempted liver therapy by means of intramuscular injections. From the tissue juice of fresh livers he removed the protein, and this filtrate was injected into the gluteal muscles. Every day 2 cc. of the extract, which is equivalent to 5 Gm. of fresh liver, was administered. This method was successfully employed in 100 patients, 40 of whom had pernicious anemia. In the majority of the patients with pernicious anemia the treatment required from six to eight weeks, and in some severe cases it was continued for from ten to twelve weeks. A case with "liver resistance" was not observed; on the con-

trary, this method was successful in patients in whom the usual liver treatment had been a failure. Even spinal symptoms could be influenced, but in these cases the treatment had to be prolonged. In cases of secondary anemias the hemoglobin content and the number of erythrocytes increased more slowly than in patients with pernicious anemia; however, a complete regeneration of the blood status was possible without resorting to medication with iron and arsenic. It was also noted that the patients who were given these intramuscular injections of liver extract showed a considerable increase in weight. Consequently the treatment was attempted in convalescents and other patients in whom an increase in weight was desirable. The results were likewise favorable.

Treatment of Anemia with Stomach Preparations.—Bertram reports his observations on nineteen patients with anemia, who were treated with stomach preparations. Of eleven patients with pernicious anemia, ten showed an improvement in the blood picture. Stomach powder has the same therapeutic value as liver. Of three patients who formerly had been successfully treated with liver, two showed that stomach powder had the same or even better effects than the liver; in one instance the stomach powder was less effective. In three cases stomach powder became effective after a blood transfusion. In one patient the stomach preparation was entirely ineffective, whereas liver gave favorable results. It is assumed that the failure might be due to insufficient doses. Among three patients with spinal symptoms, improvement was noted in one instance. In the other two the spinal symptoms were not influenced. The stomach preparation is agreeable to the patients, sometimes more so than liver or its extracts. The dyspeptic disturbances that may develop can be counteracted by the combined administration of pepsin and hydrochloric acid. Of advantage is the fact that stomach powders are less expensive than liver preparations. In eight patients with secondary anemia of various origins, stomach powder was effective in five cases.

Effect of Inhalation of Small Quantities of Benzine and Benzene.—Schmidtmann points out that bronchial cancer has been increasing in recent years. However, the cause of this has not been determined as yet. It has been assumed by some that perhaps the pollution of the air by dust and by the exhaust from motor vehicles is an etiologic factor. In order to determine what changes are caused by the inhalation of small quantities of benzine, benzene and dust, the author made experiments on several groups of animals. It was found that when small quantities of benzene or benzine were inhaled during long periods, the animals developed emphysema, chronic bronchitis with more or less developed epithelial proliferations, and atelectatic pneumonias. In many cases extensive epithelial metaplasias developed in the pulmonary alveoli; however, neither here nor in the proliferating bronchial epithelium could malignant growths be detected. Besides these changes in the lungs, the blood-forming apparatus was injured. Gradually there developed the same changes that are noted in experimental benzene poisoning. The latter form of benzene poisoning is produced by means of subcutaneous injections in order to remove all leukocytes from animals. In the inhalation experiments described by the author, a leukemic stage was observed. In the conclusion it is pointed out that, contrary to expectations, not the local changes in the lungs but the general changes are of the greatest significance. In regard to the practical significance of these observations it is stated that, although the quantities of benzene used were small, the pollution of the air in the streets is still less. However, in industrial plants in which benzene and similar substances are used, the concentration might be even greater than that used in these experiments, and harmful effects might be the result.

Relations Between Increased Frequency of Embolisms and Intravenous Injections.—Wahlig directs attention to the increasing frequency of embolisms, which was also noted at the surgical clinic in Heidelberg. In order to determine whether the assumption is justified that intravenous injections are the main cause of this, he investigated the clinical histories of patients who had died of embolism during the years from 1919 to 1929. He comes to the conclusion that this assumption is not tenable. However, he did note that obese patients were especially subject to embolisms. He thinks that obesity predisposes to thrombosis and embolism, especially in those cases in which it develops rapidly after a preceding undernourishment, as was the case after the Great War.

Prognosis of Thrombo-Angiitis Obliterans.—Schlesinger stresses that if thrombo-angiitis obliterans, which is especially frequent among young men, is diagnosed correctly, and if wrong treatment is avoided, the prognosis is not always unfavorable. He recommends conservative treatment and warns against overhasty amputations. Excessive smoking and overexertion constitute great dangers to the patient with thrombo-angiitis obliterans. In the therapy the application of heat should be avoided. But advisable are injections with hypertonic solution of sodium chloride or other substances; also oral administration of glyceryl trinitrate, theobromine preparations, and small doses of iodine. Protein therapy may be helpful if the reactions are not too strong. Galvanization and roentgen therapy have also been employed, and lukewarm carbon dioxide baths have been found helpful. In some instances the denudation of the femoral artery and removal of periarterial indurations are advisable. In the conclusion the author emphasizes that the conservative therapy requires patience, because quick cures are not possible. Crippling amputations can frequently be avoided, especially in younger persons.

Medizinische Klinik, Berlin

26: 1655-1694 (Nov. 7) 1930

Roentgen Detection of Benignancy and Malignancy of Diseases of Bones. R. Kienböck.—p. 1655.
Significance of Spleen in Diseases of Blood. K. Gutzeit.—p. 1656.
Etiology and Therapy of Functional Vomiting. E. Czyhlarz and K. Singer.—p. 1662.
*Alkali Necrosis of Uterus and of Adnexa Following Injection of Soap-Powder Solution into Uterus. W. Bickenbach.—p. 1663.
*Poisoning with Acetylsalicylic Acid. J. Balázs.—p. 1664.
Has Frequency of Pulmonary Cancer Increased? F. Herz.—p. 1666.
Codeinism. W. Heimann-Hatry.—p. 1669.

Alkali Necrosis of Uterus and of Adnexa Following Injection of Soap-Powder Solution Into Uterus.—Bickenbach reports the case of a woman, aged 27, who died as the result of a criminal abortion. The anamnesis revealed that the father of the expected child had injected a solution of soap powder into the uterus by means of a Braun syringe. During the injection the patient felt intense pains but, because the expected effect did not set in, the same injection was repeated a day later. The patient had severe hemorrhages, and the expulsion of a 3 months' old fetus occurred twenty-four hours after the second injection. The day after, the patient's condition had become so critical that she was brought to the clinic. On account of peritonitis, a laparotomy was done. The uterus and the adnexa had to be removed. Microscopic examination revealed necrosis. Immediately after the operation the patient's condition was improved. Later, however, she died. The author describes the results of the postmortem examination and reviews similar cases from the literature. He comes to the conclusion that the necrosis was caused by the alkali hydroxides which are contained in the soap powders and which are newly formed during solution in water. The corrosive effect is due to the hydroxyl ions.

Poisoning with Acetylsalicylic Acid.—Balázs points out that in Hungary numerous attempts at suicide are made with acetylsalicylic acid. A statistical report shows that among 752 cases of attempted suicide with acetylsalicylic acid only four ended fatally. The amounts taken varied between 5 and 95 Gm. In the majority of cases from 20 to 30 Gm. had been taken. The author's experiences indicate that a quantity of from 30 to 40 Gm. is the minimal lethal dose. However, in the literature there is a report of a case in which 20 Gm. had a fatal effect, but it may be assumed that in this instance a hypersusceptibility existed. The symptoms of acetylsalicylic acid poisoning usually are headache, a sensation of dizziness, tinnitus aurium, nausea, gastric disorders, heartburn, general prostration and thirst. The patient is pale and his pulse is rapid and weak. In rare cases, bradycardia may be noted. As a rule there exists a slight increase in temperature. In severe cases there may develop profuse perspiration, which is sometimes accompanied by a decrease in the temperature. The respiration is irregular even in minor cases; in cases of medium severity it is accelerated and deep, and in severe poisoning it

is of the Kussmaul type. Persons who are severely poisoned show also the clinical aspects of acidosis. In regard to the treatment the author states that irrigation of the stomach should be done, even if the poison has been taken from eight to ten hours before. Because acetylsalicylic acid is not readily dissolved by water, considerable quantities are retained by the stomach for many hours. Saline purgatives also are effective in eliminating the poison from the gastro-intestinal tract. To counteract the acidosis is difficult. The author gained the best effects with intravenous injection of a 4 per cent solution of sodium bicarbonate. The injections are repeated several times. The sodium bicarbonate may be administered by rectum and, after the vomiting has ceased, also by mouth. Cardiac stimulants and medicaments for increasing the blood pressure are necessary only in severe cases. In order to offset the loss of fluids caused by excessive perspiration and vomiting and to stimulate diuresis, the patient should be given large quantities of cold tea. In the literature are reports of cases of poisoning with therapeutic doses of the combination of quinine and acetylsalicylic acid. In the cases that came under the author's observation, however, the aspects of quinine poisoning were dominating, but the symptoms were not more severe than if only quinine had been given. The author's observations do not corroborate the assertion of some authorities that the combination increases the toxicity.

Münchener medizinische Wochenschrift, Munich

77: 1919-1958 (Nov. 7) 1930

*Pernicious Anemia and Liver Substance. K. Felix.—p. 1919.
*Causes of Yellowish Discoloration of Skin in Renal Insufficiency. E. Becher.—p. 1922.
Criticism of Treatment of Lupus Vulgaris by Means of Spleen Preparations. H. Nagell and J. Liers.—p. 1923.
Psycho-Encephalosis: Psychic Aspects of Abortive Forms of Epidemic Encephalitis. J. S. Galant.—p. 1924.
*Therapy of Postencephalitic Parkinsonism. F. Stemplinger.—p. 1926.
*Chronic Strychnine Poisoning. E. Leimert.—p. 1930.
Prophylactic Intravenous Injection of Hormone of Posterior Lobe of Hypophysis Following Operative Delivery. E. Fauvet.—p. 1931.
Treatment of Traumatic Tetanus by Means of Solution of Secondary Butylbrompropenylbarbituric Acid. R. Stohr.—p. 1933.

Pernicious Anemia and Liver Substance.—In the first part of the article, Felix discusses the etiology of pernicious anemia, especially the causes of the changes in the blood. He points out that before the era of liver therapy these disturbances were thought to be due to a toxin. Since the introduction of liver therapy, however, it has been generally assumed that the active substance in the liver substitutes for a deficiency. The first sign of the action of liver is the increase in the reticulocytes, which is followed by an increase in the number of erythrocytes and in the hemoglobin content. The active substance in the liver reestablishes the equilibrium between formation and destruction of erythrocytes. Besides in the liver, this active substance also occurs in other organs; namely, the kidneys, the skeletal muscles, the gastric juice, the gastric mucous membrane and the muscles of the stomach. The author thinks that the active substance is a type of promoting substance, the presence of which is necessary for the normal course of the lipoid metabolism in the various cells and tissues, and in this respect it resembles the hormones.

Causes of Yellowish Discoloration of Skin in Renal Insufficiency.—Becher directs attention to the fact that in cases of renal insufficiency, especially in contracted kidney, one may observe a peculiar pale yellowish discoloration of the skin. It has been pointed out by other investigators that a similar yellowish discoloration may be observed in pernicious anemia. However, careful observation will reveal differences. In pernicious anemia the peculiar pigmentation of the skin is noticeable on the entire body surface. The serum shows the typical golden yellow, and the urine is rich in pigments. In pernicious anemia the discoloration of the skin may therefore be ascribed to the color of the serum and of the urine. In renal insufficiency, however, the condition is somewhat more complicated. It can be noted that the yellowish discoloration is most pronounced on the face and hands; that is, it is present where the influence of light is effective. The serum as well as the urine is pale in renal insufficiency. In order to determine the causes of the yellowish color of the skin, the author made tests on patients with renal insufficiency and experiments on animals. He reaches the conclusion that the yellowish discoloration develops as follows: In renal insufficiency, chromogens of urine pigments are retained and become stored in the tissues and in the skin. Under the influence of light the chromogens are, as the result of oxidative processes, changed into pigments. In the skin of patients with contracted kidneys the same chromogens could be demonstrated that are found in the pale urine, in the serum and in the tissues of such patients.

Therapy of Postencephalitic Parkinsonism.—Stemplinger shows that postencephalitic parkinsonism can be effectively treated with atropine. The therapy is begun by giving three times daily 1 drop of a 0.5 per cent solution of atropine sulphate. Every day the dose is increased by one drop, so that after three weeks the patient receives three times daily 21 drops of the solution. This medication is agreeable to most patients and its effect becomes noticeable during the first week. The walk becomes more sure and quicker, the hands become movable, the face loses its masklike expression and the eyes become less staring. If the atropine treatment has no effect, the diagnosis is incorrect; catatonia might have been mistaken for parkinsonism. The atropine cure was never found to have harmful effects. The author employed this treatment on twenty-six patients. In two of them it was discontinued on account of a doubtful diagnosis. In fourteen cases the treatment is completed; of the patients, six are capable of following their occupations, five are considerably improved and are able to perform light work, and three show little improvement as a result of physical or psychic defects. In the other ten patients the treatment is not yet completed. The author points out that postencephalitic parkinsonism is comparatively frequent. It is often noted after the so-called head influenza. Only a small percentage of such patients are in institutions; the majority are being cared for by their families. Their condition is deplorable because they suffer and are without hope for recovery. The author advises the practitioners to report such patients and see to it that they are given atropine treatment for from four to six weeks. If possible, the treatment should be given in an institution.

Chronic Strychnine Poisoning.—Leimert describes the clinical history of a girl, aged 18. She complained of drawing pains and stiffness in the extremities and a twitching of the muscles. She had tonoclonic spasms, which began with a cry and were of a primarily tonic character. Especially pronounced were the contractions in the flexor muscles of the extremities. There were indications of opisthotonos, the face was cyanotic, the pulse was weak, and during the spasm-free intervals the patient was conscious. The tetanic attacks were of short duration, but they left the patient extremely weak. The Babinski reflex was positive. Spasms in the vesical sphincter developed, the vision was impaired, an erythema resembling that in scarlet fever became manifest, and sudden and intense psilosis indicated poisoning. Besides the psilosis, the case showed several other peculiarities. The spasms did not develop immediately after ingestion of the poisoned (strychnine) wheat but two weeks later. The symptoms of poisoning lasted unusually long. The patient was in the hospital for six months and the recovery was not complete when she was discharged. A subacute poisoning had become chronic.

Wiener klinische Wochenschrift, Vienna

43: 1365-1396 (Nov. 6) 1930

Relation Between Oral Sepsis and Skin Diseases. W. Kerl.—p. 1365.
*Irradiation in Treatment of Thrombophlebitis. J. Halban.—p. 1368.
Tuberculosis in Infants. W. Feilendorf.—p. 1369. C'cn.
Clinical Diagnosis of Primary Tumors on Basis of Metastases. F. Lang.—p. 1372.
Acetonuria of Cerebral Origin. O. Römcke.—p. 1373.
Peroral Chemotherapy in Purulent Diseases of Eye. N. Blatt.—p. 1374.
Plastic Surgery for Reducing Size of Ears. E. Eitner.—p. 1377.
Idem. I. Eisenklam.—p. 1377.
Medicinal Treatment of Insomnia. A. Pilcz.—p. 1377.
Surgical Treatment of Gastric and Duodenal Ulcers. H. Steindl.—p. 1380.
Various Stages in Tuberculosis in Children. R. Wagner.—p. 1382.

Irradiation in Treatment of Thrombophlebitis.—Halban employed roentgen irradiation in seventeen cases of thrombophlebitis. In seven instances there existed an inflammation of the superficial veins, especially of the vena saphena, in five cases the deeper lying veins were affected, and in the other five cases both the superficial and the deeper veins were

involved. The irradiation was applied on one or on several fields according to the extent of the process. The tension was 180 kilovolts, the current strength 3 milliamperes, the filter 0.5 mm. of zinc plus 2 mm. of aluminum, and the distance 28 cm. Thus about 15 per cent of a unit skin dose was applied. At each sitting, two or three fields were irradiated. In some cases one treatment was sufficient, in others the irradiation was repeated after two or three days, and eventually a third irradiation became necessary. In regard to the effect of the roentgen therapy the author states that the painfulness, which is usually intense in thrombophlebitis, ceases immediately following the irradiation, and it cannot be doubted that the products of inflammation disappear more quickly than is otherwise the case, and as a result of this the temperature returns to normal sooner, the swellings disappear more quickly, and the period required for bed rest is considerably shortened. The fact that the patients had to be moved, on account of an unfavorable location of the roentgen room, was found to be a distinct disadvantage, because embolisms developed. For this reason the author advocates a portable roentgen apparatus, which can be brought to the patient's bedside.

Vrachebnaya Gazeta, Leningrad

20: 1476-1546 (Oct. 31) 1930

Clinical Manifestations of Polyserositis. I. Bogoslovskiy.—p. 1483.
*Ether in Treatment of Infected Wounds. P. Koristenskiy.—p. 1489.
Experience with Schede-Bier's Method in Treatment of Osteomyelitis. G. Sukhanov.—p. 1493.
*Exploration of Gastric Secretory Functioning Without Stomach Tube. I. Rodov.—p. 1497.
Case of Phlegmonous Gastritis. P. Litsyn.—p. 1501.
Permeability of Skin for Benzine and Benzene. N. Lazarev, A. Brusilovskaya and F. Livshits.—p. 1513.

Use of Ether for Treatment of Freshly Infected Wounds.—Koristenskiy's experience includes 1,000 cases of infected accidental or surgical wounds treated with ether. Lacerated wounds were most frequent. The infection of surgical wounds usually occurred from the presence of infectious foci in the proximity, or from failure of asepsis during the intervention. According to the size of the wound, from 5 to 20 Gm. of ether was poured into it; the pouring was repeated from two to five times, at short intervals. The ether was poured from a drop bottle when the wound was small. Superficial wounds were only moistened with ether from one to four times. Lacerated wounds were previously carefully enlarged with a blunt hook. Blood clots, foreign bodies or crushed tissues were removed between pourings. Severed tendons, fascia, muscles and nerves were sutured after the first pouring of ether. As soon as the etherization was completed, the surrounding skin was painted with a 5 per cent tincture of iodine, and then superficial sutures were applied. In complicated wounds in which the destruction of tissues was considerable, skin grafts were used. Such grafts were required in sixty-five cases, and resection of adjacent tissues (performed between pourings) in eighty-six cases. Silk, flax or, preferably, catgut, was used for deep sutures, and silk or ordinary thread for superficial sutures. Before sutures were applied, care was taken not to leave an appreciable amount of ether in the wound; otherwise, instead of a mild and beneficial irritation, a hyperirritation might develop, impairing the vitality of the tissues. Owing to the local anesthetic action of ether, sutures were well tolerated, without general anesthesia, in cases of complicated wounds. When general anesthesia was required, the amount of ether used locally was reduced. The author found that ether prevented a secondary infection in fresh wounds; it induced healing by first intention in 93 per cent of his cases. With the ether method, sutures in layers and implants could be used in cases of freshly infected wounds; it enabled application of deep sutures in cases of an accidental failure of asepsis in the course of an operation. Moreover, tampons and drainage could frequently be avoided. Since the menace of a secondary infection proved to be reduced, operations for tuberculous foci, especially for an ostearticular tuberculosis, could be performed more frequently. Used at an operation for phlegmons, furuncles or carbuncles, irrigations with ether promoted a rapid reduction of the inflammatory infiltrate. The favorable action of ether is explained not only by its bactericidal property but also by the induced increase of phagocytosis, and consequently of the defensive capacity of the tissues. Hence the etherization method is considered as one of irritation therapy. It should be kept in mind that ether is highly inflammable; therefore the use of such apparatuses as, for instance, a Paquelin cautery, must be avoided.

Examination of Gastric Secretory Functioning.—Rodov's researches were based on Grossmann's and Pineles' statements that theobromine sodiosalicylate exerts an antidiuretic action in the presence of an acid gastric juice and a marked diuretic action in the presence of a nonacid gastric juice. On combination of hydrochloric acid with theobromine sodiosalicylate a substance splits up which impairs diuresis. The author examined a group of patients with gastric ulcer and hyperacidity and another group with suspected ulcer and normal gastric acidity and a third group with deficient or reduced gastric acidity. For the determination of the actual acidity of the urine, Rodov used an indicator consisting of an alcoholic solution of methyl red and methylthionine chloride (0.5 cc. of each in 1,000 cc. of alcohol). The indicator induces a blue hue in an acid solution and a green hue in an alkaline solution. Twenty-seven patients with gastric ulcer and with intact kidneys were given bouillon for breakfast, at 8 o'clock. The urine was collected at 10 and 11 o'clock. Lunch was given at 12, and the urine was collected at 2 and at 3 o'clock. Bouillon was given again at 8 o'clock in the evening, and the urine was collected at 10 and at 11. The urine was always examined with the indicator. In cases in which the gastric acidity was normal or increased, the nocturnal urine proved to be acid (blue hue); the p_H was about 6. The urine obtained after breakfast as well as after lunch or dinner proved to be alkaline (green hue). A deficient or reduced acidity of the gastric juice was found in the following cases: There was aciduria after breakfast whereby the p_H was 5.5. The appearance of alkalinuria after breakfast pointed to a gastric hyperacidity, while aciduria pointed to a deficiency of the gastric acidity. The method was advantageously combined with Benedict and Fuld's test. For detection of occult blood in the gastric juice the patients were given from 50 to 75 cc. of a 3 per cent solution of hydrogen dioxide together with half a yolk of egg and a half teaspoonful of sodium bicarbonate. In cases of ulcer, when erythrocytes were present in the gastric juice or in the stools, the outline of the stomach became visible owing to its distention by a foam bubble (splitting of oxygen from erythrocyte catalysis). The foam bubble was considerable in cases of hyperacidity; the patient sometimes vomited a foamy mass. No other by-effects were observed. Tests for occult pain were made in patients with positive reactions of gastric hyperacidity and gastric hypersecretion and of occult blood. The patients were induced to drink slowly (through a pipet) 200 cc. of a 0.5 per cent solution of hydrochloric acid, fasting. In cases of gastric ulcer the induced hyperacidity and the resulting irritation caused an "ulcer reaction" forty-five minutes afterward. The reaction consists in a sensation of compression, pain in the epigastric region, burning, blushing and perspiration. The pain disappeared after administration of an alkali. The procedure was as follows: The patients were given a test meal and then the gastric juice was withdrawn by the fractional method. The free hydrochloric acid, the combined hydrochloric acid and the total acidity were determined by titration; benzidine or amidopyrine tests were used for the detection of blood. Three times the next day the patients were given 0.5 Gm. of theobromine sodiosalicylate, while the diet was poor in chlorides. The third day, 1,000 cc. of tea and 1 Gm. of theobromine sodiosalicylate was given between 8 and 9 o'clock in the morning. The urine first was collected hourly, for five hours; then every three hours, until the end of twenty-four hours. A day later the patients were given bouillon at 8 o'clock in the morning; the urine was collected at 10 and 11. At 12 the patients were given lunch; the urine was collected at 2 and at 3 o'clock. Dinner was given at 4 o'clock, and the urine was collected at 6 or 7. The actual acidity of the urine was then determined. The next day, the patients were treated with an ordinary diet. The following morning they were given an Ewald-Boas test meal fasting. Half an hour later they were induced to drink slowly a solution of sodium bicarbonate; meanwhile the left side of the epigastrium had been auscultated. A day afterward the patients were given from 50 to 75 cc. of a 3 per cent solution of hydrogen dioxide, after urination and evacuation of feces (voluntarily or with an enema) had taken place; they remained in a horizontal position with the uncovered

abdomen turned to light. Thus the outline of the stomach, distended by a foamy bubble, became visible. The author's conclusions are that theobromine sodiosalicylate considerably increases diuresis in cases of a deficient acidity of the gastric juice; it causes oliguria in cases of gastric hyperacidity and reduces the diuresis in cases of a normal gastric acidity. Hence the quality of the gastric juice can be determined without the employment of a stomach tube. A positive hydrogen dioxide reaction (formation of a foamy bubble in the stomach) testifies to gastric bleeding occasioned by a defect of the epithelium. A positive test for occult pain (epigastric pain and signs of vagotonia) indicates the presence of a fresh ulcerous process in the stomach or in the duodenum. The method described may prove to be particularly valuable in cases in which a stomach tube cannot be introduced on account of an excessive pharyngeal reflex, esophagospasm or stenosis.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

74: 5359-5462 (Nov. 1) 1930

Causes and Treatment of Certain Lung Hemorrhages Due to Tuberculosis. B. H. Vos.—p. 5362.
Sore Throat. D. Herderschée.—p. 5368.
*Indications and Outcome of Operative Treatment of Tuberculous Spondylitis. W. F. Suermondt.—p. 5379.
Some Fragments from Works of Oribasius, Which Reveal the Valuelessness of Doctrine of Signatures. C. Bakker.—p. 5385.
Status of Higher Education in Belgium in Middle of Sixteenth Century. A. J. van der Weyde.—p. 5393.

Indications and Outcome of Operative Treatment of Tuberculous Spondylitis.—Suermondt summarizes: On children with tuberculous spondylitis one must not operate, as conservative treatment gives the best results. In the case of adults, on the other hand, operative stiffening of the spinal column may give excellent results, thus improving the earning capacity of the patients and shortening greatly the duration of their illness. The chief contraindications to operative treatment is tuberculosis in other organs, especially the lungs. The best operative method is the Albee procedure. It is of great importance to treat the patient before and after the operation in the ventral position and, above all, not to let him get up too soon after the operation, since otherwise the transplant will not have coalesced with the spine. In spondylitic paralysis the outcome of the operation is not usually favorable. One may operate only under the most strict neurologic indications and only after sufficiently long conservative treatment, as experience teaches that such paralysis may disappear spontaneously after a long time. If the operation is decided on, the best results are secured by means of costrotransversectomy.

Hospitalstidende, Copenhagen

73: 905-932 (Sept. 11) 1930

Vaccination Against Tuberculosis with B C G: Review. O. Thomsen.—p. 905.
*Neurasthenia in Achylia With and Without Rise in Blood Index. B. Faber.—p. 915.

Neurasthenia in Achylia With and Without Rise in Blood Index.—Faber concludes that the triad achylia, megalocytosis and neurasthenia (Warburg-Jørgensen) apparently cannot be maintained as a nosologic entity, for he finds that neurasthenic symptoms in achylia are equally frequent whether there is a rise or a fall in the blood index. Neurasthenia in pernicious anemia and megalocytosis is believed not to depend on organic changes in the central nervous system but to be an exhaustion neurasthenia similar to that seen in numerous other diseases.

73: 933-944 (Sept. 18) 1930

*Undulant Fever with Unusual Course. S. Heiberg.—p. 933.

Undulant Fever with Unusual Course.—Three of Heiberg's ten cases of undulant fever presented unusual features. The first case was complicated with endocarditis believed to be due probably to the undulant fever. The second shows that pregnancy can be terminated by normal delivery at term in spite of existing infection with *Brucella abortus*. In the third case there was temporary marked enlargement of the liver and spleen.

73: 945-970 (Sept. 25) 1930

Physician's Duty of Silence and Right to Silence. H. C. Hagtdorn.—p. 945.
*Sedimentation Reaction in Diseases of Liver and Biliary Tract. T. Geill.—p. 954.

Sedimentation Reaction in Diseases of Liver and Biliary Tract.—Geill regards the sedimentation reaction of the blood as of some value in differential diagnosis, a lowered or normal or possibly also slightly increased reaction pointing to diffuse disease of the parenchyma (acute hepatitis). While moderately increased values do not exclude hepatitis, they are relatively rare in this disorder. In general the reaction seems to be without prognostic value.

73: 971-998 (Oct. 2) 1930

*Action of Ephedrine on Blood Pressure. J. Foged.—p. 971. C'td.
*Vitamin B Complex and Kidneys, Especially Mitochondria Structure. P. Vogt-Møller.—p. 980.
*Blood Sedimentation Reaction Following Injection of Sulphur. S. A. Holbøll and G. Herborg.—p. 985.
Technic in Investigations on Duodenal Secretion. T. Christiansen.—p. 991.

Action of Ephedrine on Blood Pressure.—In 133 of 194 surgical patients, Foged found a notable rise in the systolic blood pressure, averaging about 20 mm. of mercury, after the injection of 0.1 Gm. of ephedrine. This rise seemed to be independent of the normal blood pressure when this was less than from 150 to 160 mm. In sixty-one cases there was no noticeable rise in blood pressure during the first twenty minutes after the administration of ephedrine. The power of ephedrine to elevate the blood pressure appears to be lessened in patients with arteriosclerosis, weakened general condition and hypertension.

Vitamin B Complex and Kidneys, Especially Mitochondria Structure.—In mice fed on a diet deficient in vitamin B complex, Vogt-Møller found mitochondrial degeneration in the convoluted tubules, increasing as the avitaminosis progressed, with return to normal on the administration of vitamin B complex. The degeneration is ascribed to disturbances of a physicochemical nature between the cytoplasma and the mitochondria due to the disturbance in metabolism dependent on the avitaminosis.

Blood Sedimentation Reaction Following Injection of Sulphur.—Holbøll and Herborg report that one intramuscular injection of sulphur in persons with normal blood pressure causes a noticeable change in the sedimentation reaction characterized by a rise which begins in all cases after about thirty-six hours, usually reaches the maximum after from three to five days and as a rule is still demonstrable three weeks after the injection.

Hygiea, Stockholm

92: 769-800 (Oct. 31) 1930

Technic of Treatment of Fractures: Application of Second Dressing Without Removal of Plaster Cast. M. Persson.—p. 769.
*Case of Narcolepsy with Cataplexy. H. Fröderberg.—p. 788.

Case of Narcolepsy with Cataplexy.—In the case of paroxysmal hypersomnia reported by Fröderberg, the attacks have become more frequent and more imperative, with added symptoms; first, attacks of a characteristic general loss of muscular tone due to certain affects (cataplexy, affective loss of tone), and then certain psychic changes, particularly of a paranoid nature.

Ugeskrift for Læger, Copenhagen

92: 1039-1058 (Nov. 6) 1930

*Dependence of Late Syphilitic Conditions on Antecedent Treatment. E. Gottlieb and N. I. Nissen.—p. 1039.
*Significance of Positive Tuberculin Reaction in First Three Years of Life. S. Monrad.—p. 1046.

Dependence of Late Syphilitic Conditions on Antecedent Treatment.—The results of the investigations of Gottlieb and Nissen show that the use of arsphenamine does not increase the tendency to syphilitic conditions of the cardiac vessels and also indicate that arsphenamine protects against their development. Long-continued treatment with mercury likewise seems to afford some protection against the development of late syphilitic disease.

Significance of Positive Tuberculin Reaction in First Three Years of Life.—On the basis of investigations on material from 1919 to 1930, Monrad reasserts his conclusion that all children aged less than 1 year with positive tuberculin reactions have tuberculosis, while about 88 per cent of the children in the second year of life with positive reactions and about 82 per cent of those in the third year with positive reactions have tuberculosis.